COST-BENEFIT ANALYSIS OF LEVEL II FIELDWORK FOR BACHELOR'S-LEVEL AND BASIC MASTER'S-LEVEL STUDENTS IN OCCUPATIONAL THERAPY

By

LINDA DEAN SHALIK

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Linda Dean Shalik

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The costs associated with clinical education in the health professions have been scrutinized by educational and hospital administrators in recent years. In some cases, the assumption has been that these programs incur a cost to the hospital. Studies to this date, although limited in scope, have not supported this cost assumption. Applying the concepts of cost-benefit analysis to clinical education in one health care field, occupational therapy, the following basic questions were addressed:

1. Is there a cost or benefit accrued by clinical fieldwork sites as a result of occupational therapy Level II bachelor's-level student placement, basic master's-level student placement, and bachelor's-level and basic master's-level student placements combined?

2. When other selected relevant variables are held constant, to what extent are there differences in basic master's-level and bachelor's-level placement, week of the fieldwork experience, type of fieldwork, number of fieldwork experiences, and age of student?

Study participants included 181 pairs of bachelor's-level or basic master's-level occupational therapy students and their respective clinical supervisors from 12 occupational therapy educational programs in the United States. Costs and benefits were measured in terms of time investment by students and supervisors in fieldwork and clinic-related duties. Data were obtained from weekly time logs kept by the student/supervisor pairs.

Results of the study revealed an overall institutional benefit from the fieldwork placement regardless of the degree level of the student. A strong curvilinear relationship ($p < .0001$) was found between week of fieldwork and the value of the fieldwork, with all types of fieldwork incurring a benefit to the institutions after the sixth week. However, significant differences ($p < .05$) were found in the degree of benefit between different types of fieldwork. No differences in the value of the benefit were found between degree levels of students, nor was age related to the overall benefit. The average benefit from a fieldwork placement ranged from $4700 to $4850 depending upon whether it was a 12-week or 13-week assignment.

CHAPTER I
INTRODUCTION

Background and Justification

The rising cost of health care has been a continuing national issue in recent years. Health expenditures constituted 4.6% of the gross national product in 1950 and were expected to increase to 10.5% in 1985 (Arnett, Cowell, Davidoff, & Freeland, 1985). National response to these rising costs has been a movement toward cost containment measures such as prospective payment systems and disease category related group payment programs (Arnett et al., 1985; Curtin & Zurlage, 1984; Dowling, 1979).

The pressure toward cost containment has brought about increased scrutiny of some costs that, while not directly a part of patient care, have traditionally been included in the charges passed on to consumers or third party payers. Not surprisingly, these groups have become much less willing to shoulder additional costs beyond those associated with direct patient services (Chung, Spelbring, & Boissoneau, 1980). Financing of student education programs that take place on hospital sites is one example of these additional costs. Hospital administrators have viewed these programs as incurring an overall cost to the institution and, in some cases,

have assigned a certain amount per patient for estimated "costs" of clinical education (Busby, Leming, & Olson, 1972).

Some question exists, however, on the part of educators as to whether students really do incur costs to the clinical sites. There is contention that students actually pay for their presence (and perhaps bring in additional revenue) through the increased number of patient charges they generate (Chung et al., 1980; Freymann & Springer, 1973). That is, students may constitute a source of inexpensive labor that serves to increase productivity (and revenue) in hospital departments where they train. While both sides' opinions have been clearly stated, studies of the question have been limited to singular hospitals, educational institutions, or localized geographic areas (Chung et al., 1980; Halonen, Fitzgerald, & Simmon, 1976; Hammersberg, 1982; Keim & Carney, 1975; Leiken, Stern, & Baines, 1983; Pobojewski, 1978; Porter & Kincaid, 1977).

Coincident to the above trends in health care and clinical education finance has been the movement in many allied health professions to upgrade educational requirements from the bachelor's degree to a required master's degree for entry into the professions. Speech pathologists, for example, are currently required to possess a master's degree for independent practice (Council on Professional Standards in Speech-Language and Audiology, 1981) and such a requirement is being extended to physical therapists (MacKinnon, 1984). The occupational therapy profession is currently considering

such a change (American Occupational Therapy Association [AOTA], 1984b), with a recommendation made to upgrade the current basic master's-level program by adding advanced professional training (Rogers, 1980a, 1980b). Issues of quality are central to these decisions, but questions of costs and benefits should also be considered.

Clearly, the didactic on-campus training of a master's-level student will incur greater costs than will the education of a bachelor's-level student both in foregone income to the student and in direct costs resulting from the increased number of classes. However, in light of the earlier mentioned concern about the costs of clinical education, educational leaders should also consider possible differences in the costs and benefits between bachelor's-level and master's-level students.

The occupational therapy profession presents the appropriate conditions for a study of the question relative to costs and benefits of clinical fieldwork placement as well as the differentiation between bachelor's-level and basic master's-level students. Occupational therapy programs produce both of these entry level students and both groups are assigned to final fieldwork placement, the Level II fieldwork experience, at the conclusion of the academic preparation. Moreover, occupational therapy educational and professional leaders are currently at the decision-making stage in determining future entry requirements. It is fitting that the differences in costs or benefits to the clinical setting of these

two levels of students be compared in order to add an important financial consideration to the decision-making process.

Cost-benefit analysis, an important technique derived from welfare economic theory and the theory of consumer's surplus (Dasgupta & Pearce, 1972), has been increasingly applied to various questions in the health care field (Warner & Hutton, 1980). In his explanation of the application of cost-benefit analysis to health care, Klarman (1974) stated

> cost-benefit analysis aims to do in the public sector what the better known supply-demand analysis does in the competitive, private sector of the economy. When market failure occurs--whether through the absence of a market or through the existing market's behaving in undesirable ways--public intervention comes under consideration. Cost-benefit analysis is helpful in determining the nature and scope of such intervention. (p. 326)

Cost containment has become a major consideration both in health care and educational planning. National leaders have come to realize that there are not unlimited dollars with which to buy educational and health care services. Priorities must be set and choices must be made.

This research was intended to provide basic knowledge to assist the educational leaders in one health care provider field, occupational therapy, in their planning of both fieldwork placement and professional entry-level educational requirements. In preparing for this research it was believed that results indicating overall financial benefits to clinical sites as the result of student placement would help justify continued free placement of students in fieldwork sites with

any charges passed on to consumers for educational costs to be questioned. On the other hand, results that would indicate an overall financial cost to clinical facilities would refute previous research and suggest the need for further research.

Further, the results of comparisons between the cost-benefit analyses of bachelor's-level and basic master's-level students is valuable in supplying partial evidence as to whether basic master's-level education contributes to increased productivity early in the clinical career. Knowledge such as this is important in helping to evaluate the efficacy of increasing educational requirements for entry into the profession.

In summary, there were two basic justifications to this study. First, it was to serve to increase the knowledge base regarding clinical education in a field that is struggling to make decisions regarding its future requirements for professional entry and the impact throughout the health care system that these decisions will make. Secondly, the study was designed to demonstrate the utility, as well as the limitations, of the use of quantitative methods for research in a human services profession.

Statement of Purpose

The primary purpose of the study was to determine whether the placement of Level II occupational therapy fieldwork students in clinical facilities brings about a net cost or benefit to the facilities. The secondary purpose was to determine what other factors are related to the costs or benefits of fieldwork placement.

More specifically, there were two basic questions to be answered by this study.

1. Is there a cost or benefit accrued by clinical fieldwork sites as a result of occupational therapy Level II bachelor's-level student placement, basic master's-level student placement, and bachelor's and basic master's-level student placements combined?

2. When other selected relevant variables are held constant, to what extent are there differences in (a) basic master's and bachelor's-level placement, (b) week of the fieldwork experience, (c) type of fieldwork, (d) number of fieldwork experiences, and (3) age of student?

In order to answer the above questions, it was necessary to (a) determine and classify those activities that can be identified as either costs or benefits relative to student placement, (b) establish methods for measuring the above costs and benefits, (c) apply cost-benefit analysis techniques to these data to determine net cost or benefit of student placement in the fieldwork sites, and (d) determine additional factors that might be related to costs and benefits in fieldwork.

Delimitations

The study was confined to Level II fieldwork students of participating bachelor's-level or basic master's-level programs in occupational therapy. While there were students in other levels of clinical fieldwork experience, often on-site concurrently with Level II students, these other students were not included in the research.

Data collection for the study took place during the summer fieldwork period between May and September, 1985. Included were 276 bachelor's-level and 108 basic master's-level student/supervisor pairs, or dyads. Usable data were obtained from 181 of these student/supervisor pairs, 131 bachelor's-level and 50 basic master's-level. Students in the study attended 5 of the 8 basic master's-level programs and 7 of the 50 bachelor's-level occupational therapy programs accredited by the American Occupational Therapy Association. Registered occupational therapy supervisors were employed by approximately 300 varied clinical fieldwork sites scattered throughout the United States. Inclusion of an educational program in the study was based on the willingness of the occupational therapy program director and fieldwork coordinator to participate. Further, participation of individual students and supervisors was voluntary.

Data were obtained through self-reported time logs, kept separately by each student and each supervisor. Additional information concerning average supervisors' salaries and charges per treatment unit was gathered through a questionnaire sent directly to clinical coordinators.

The study was concerned solely with the direct economic costs and benefits to the facility resulting from the presence of fieldwork students and the implementation of the clinical education programs. In other words, costs and benefits were defined specifically from an institutional point of view. Lifetime benefits that are normally

calculated in cost-benefit analyses were not included since costs and benefits were perceived to extend only marginally beyond the "life" of the student affiliation period (Keim & Carney, 1975). Likewise, discounting of costs or benefits was not warranted since they were incurred in a period of less than a year (Klarman, 1974). Finally, the cost-benefit analysis included only those costs or benefits which were tangible, i.e., those factors that were readily measurable and could be assigned a dollar value.

Assumptions

For the purposes of this research, the following procedural assumptions were made:

1. Personnel time constitutes the major portion of costs and benefits in the study.

2. Per unit treatment charges constitute the basic unit of cost.

3. Per unit treatment charges constitute the basic unit of benefit for patient treatment while the minimum hourly wage and therapist hourly salary represent appropriate valuation of aide-type duties and administrative duties respectively.

4. A treatment unit is a 15-minute increment of time for which charges are made.

5. Similar charges are made per unit of patient treatment regardless of who performs the treatment.

6. The value of time from supervisor to supervisor is similar.

7. Benefits are predicated on the assumption that independent patient treatment and other tasks performed by the student will release the therapist and ancillary staff for other duties.

8. Costs and benefits of student placement are limited to the clinical site; external effects are considered to be minimal.

9. Educational background and training of occupational therapy students are similar.

10. Since the Level II fieldwork experience is prescribed through the Essentials and Guidelines of an Accredited Educational Program for the Occupational Therapist (Commission on Education of the American Occupational Therapy Association, 1985), all fieldwork programs are similar.

Definition of Terms

Bachelor's-level program is an educational training program for occupational therapy in which the first two years of academic training are devoted to liberal arts and science courses and the final two years to professional training in occupational therapy. The bachelor of science degree is awarded at the successful completion of the program.

Basic master's-level program is an educational training program for occupational therapy in which a student already possesses a bachelor degree in another field and is awarded a master's degree upon the completion of the necessary science and occupational therapy professional level courses. This training is differentiated from the traditional master's degree in that it does not represent the advanced training which is usually built on bachelor's-level education.

Benefit-cost ratio is the present value of benefits divided by the present value of costs.

Clinical coordinator is a clinician who acts as the liaison between an academic program and the clinical education site.

Clinical education program consists of supervised work in a clinical setting designed to provide practical experience and to complement academic preparation.

Consumer surplus theory is an economic theory based on the concept that the excess of consumers' willingness to pay for a good or service over and above its market value is a measure of the net welfare gain from a project.

Cost-benefit analysis is a measurement technique in which the total costs of a program or project are compared to the total benefits that may be expected.

Direct costs and benefits are increased or decreased outputs or values associated with a project.

Disease category related group is a method of payment for health care in which a fee for a specific diagnosis or group of diagnoses is determined in advance and is paid regardless of actual cost.

External effects (spillovers) are costs or benefits that directly or indirectly affect others outside the project at hand.

Fieldwork supervisor is a therapist who is responsible for providing ongoing direct supervision of an occupational therapy student at the clinical site. This person is usually employed by the clinical facility rather than the educational institution.

Fieldwork site (clinical site) is a location where direct occupational therapy services are offered to health care consumers.

Foregone income is income that is lost, or not earned, while a person is engaged in an educational program.

Indirect costs or benefits reflect the economic effects of a project on the economy or society as a whole.

Intangible costs and benefits are factors for which there are no real market values.

Internal effects are costs or benefits that affect directly or indirectly the subjects under study.

Internal rate of return is a form of cost-benefit analysis in which a rate of discounting is determined that equates the initial cost with the total discounted future benefits.

Level II fieldwork is an internship or practical experience that usually occurs at or near the conclusion of an occupational therapy educational program. It represents the stage at which student competency is expected to meet that of an entry-level therapist.

Net present value method is a means of reducing streams of costs and benefits to a single number and in which costs and benefits that are predicted to occur in the future are discounted.

Occupational therapy is the art and science of directing participation in selected purposeful activities to restore, reinforce, and enhance performance developmentally, physically, and mentally in order to adapt to, correct, or diminish pathology.

Prospective payment system is a method of payment for health care services in which a fixed amount of payment is predetermined and in which payment is made regardless of cost.

Tangible costs and benefits are factors that are readily assigned a market value.

Third party payers are agencies or parties other than the consumer that are responsible for payment for health care services.

Welfare economics is a branch of economics which is normative and assumes the assessment of the desirability of various economic states to determine which is "better."

Organization of the Remainder of the Study

Chapter II is devoted to a review of the literature relevant to the study. Chapter III describes the methods utilized to answer the basic questions of the research. Chapter IV contains the results of the study and their interpretations. The final chapter contains the summary, conclusions, limitations of the study, and suggestions for further research.

CHAPTER II
REVIEW OF RELATED LITERATURE

The review of the related literature includes an overview of the origin and application of cost-benefit analysis in the field of economics with further exploration of its application to the educational and health care fields. More specifically, the first section includes the definition, history, and traditional applications of cost-benefit analysis in the public sector. The theory and constructs commonly associated with cost-benefit analysis are presented in the second section. Next, there is a brief description of the development and application of cost-benefit analysis to the field of education with particular emphasis given to its application to higher education and vocational programs. In the fourth part, the introduction and use of cost-benefit analysis in the health care sector is reviewed. The final two sections contain studies that initiated the use of time logs to evaluate time spent in clinical education programs and include studies that more formally utilized cost-benefit analysis procedures in conjunction with clinical education and allied health education.

Origin and Application of Cost-Benefit Analysis

In their well known and frequently cited article, Prest and Turvey (1965) defined cost-benefit analysis as

> a practical way of assessing the desirability of projects, where it is important to take a long view (in the sense of looking at repercussions in the further, as well as nearer, future) and a wide view (in the sense of allowing for side-effects of many kinds on many persons, industries, regions, etc.), i.e., it implies the enumeration and evaluation of all the relevant costs and benefits. (p. 683)

This definition was simplified by Sassone and Schaffer (1978) when they indicated that cost-benefit analysis is "an attempt to ascertain the net benefit (total benefit less total cost) of a policy or project" (p. 11).

Some confusion exists in the literature as to the differentiation between cost-benefit analysis and cost effectiveness. Niskanen (1967) separated the two approaches by indicating that cost effective analysis is "directed at problems in which the output cannot be evaluated in market prices, but where the inputs can" while cost-benefit analysis "should resemble the analysis of a profit-maximizing business firm" (p. 18). In other words, if the costs and benefits can be expressed in some real market values, then cost-benefit analysis is the appropriate tool. But, when there is no market value for the outputs, then cost-effective analysis is appropriate. While these definitions are fairly clear-cut, in practice the two terms are often used interchangeably. In the study reported herein, both inputs and outputs were conveniently assigned market values and thus it was classified as a cost-benefit analysis.

While cost-benefit analysis has been most often associated with the evaluation of long-range public works projects, a number of authorities (Dasgupta & Pearce, 1972; Rothenberg, 1975; Sassone &

Schaffer, 1978) have indicated that cost-benefit analysis is really a generic term that encompasses a number of evaluative procedures designed to assess the costs or benefits associated with different project choices. Sassone and Schaffer (1978) further stated, "the variety of programs addressed and the ingenuity which must be exercised in estimating costs and benefits make it particularly difficult, if not impossible, to design an all-purpose procedure" (p. 3).

Although cost-benefit analysis has been most popular during this century, the idea of measuring net costs or benefits of a public expenditure project was first suggested by a Frenchman, J. Dupuit, in his paper, "On the Measurement of Utility of Public Works," which was translated in 1844. It gained in popularity in the United States when it was applied at the federal level to projects designed for the improvement of navigation. The River and Harbor Act of 1902, for example, had built into it the requirement that costs and benefits to commerce of various programs must be taken into account (Prest & Turvey, 1965).

Further, the United States Flood Control Act of 1936 indicated that a project may be pronounced "feasible if the benefits to whomsoever they may accrue, are in excess of the estimated costs" (Dasgupta & Pearce, 1972, p. 12). As projects in the public sector continued to increase in number and expense, the demand for accountability brought about a keen interest in cost-benefit analysis as a way of ensuring the greatest value for the tax dollar.

Theoretical Base and Concepts

Cost-benefit analysis is usually associated with normative or welfare economics. The use of normative economics introduces value judgments or norms into the decision-making process. According to Sassone and Schaffer (1978), the purpose is to assess the relative desirability of different economic states or conditions.

> Abstractly, at least, the method follows a two-step paradigm: first, the stipulation of one or several criteria by which to judge states and, second, analyses of the states according to the criteria. Since the decision to implement a public project leads to a change from one economic state to another, and since our desire is certainly to determine which state is "better" (a value judgment) CBA falls directly into the province of normative economics. (p. 6).

Prest and Turvey (1965) identified four principles that are followed in carrying out a cost-benefit analysis.

1. It must be determined which costs and which benefits are to be included.
2. It must be determined how the costs and benefits are to be valued.
3. An appropriate discount rate is to be assigned.
4. Relevant constraints must be identified.

In determining costs and benefits, both internal and external effects may be considered. Often there are intangible or incommensurable factors that may affect the decision. These factors must be considered and either ruled out or incorporated into the cost-benefit comparison.

The values assigned to the costs and benefits may be determined by market prices, although this practice is sometimes criticized on

the basis that market prices do not always accurately reflect social value. On the other hand, Sassone and Schaffer (1978) stated, "often, the credibility of the analysis (hence, its value as a decision aid) is better served by using market prices as the basis for calculations, but carefully noting the direction and likely magnitude of their bias" (p. 50). With this in mind, costs and benefits in the study reported herein were assigned equivalent market values.

Usually, the costs and benefits of a project are distributed over the lifetime of the project, perhaps over several years. In order to compare and make choices between various alternatives, the time stream of costs and benefits must be converted to a single number. This is accomplished by discounting, a method used to take account of the fact that a dollar earned tomorrow is less valuable than a dollar earned today (Bowen, 1963). Much controversy exists over the appropriate rate of discounting that should be used. However, since the lifetime of the fieldwork analyzed in the present research was less than a year in duration, further exploration of the calculation of discounting was not warranted. Klarman (1974) substantiated this position when he stated, "when a project or program is short-lived, with both benefits and costs concentrated in the near future, the choice of discount rate is of minor or no consequence; indeed, for a short-lived program discounting may be dispensed with" (p. 329).

In choosing a project, it may be necessary for it to meet certain criteria, or constraints, before it can be considered a viable

choice. Such constraints may be budgetary, legal, social, political, or institutional. All of these constraints must be identified so that alternative projects that do not meet these criteria can be eliminated early. For example, a budgetary constraint would be when a dollar limit is set on each alternative project (Prest & Turvey, 1965).

Although cost-benefit analysis is a widely accepted method of measuring and comparing competing programs, there are valid criticisms of its use. Maass (1966) criticized the sole emphasis of the method on efficiency and commented, "the objective functions of most government programs are complex; yet benefit cost analysis has been adapted to only a single objective--economic efficiency" (pp. 208-209). His contention was that other factors, such as redistribution of income, should be considered as part of the decision-making process in choosing various programs. In addition, he criticized the fact that cost-benefit analysis is indifferent to the distribution of income. He questioned the assumption that a dollar of income from a program is of equal social value regardless of who receives it.

Wildavsky (1966) noted that it is fairly easy to manipulate the factors counted as costs or benefits, thus making it possible for nearly any program to meet the stated criteria. Prest and Turvey (1965) mentioned the difficulty in coming to cost estimates and the very difficult job of identifying and valuing benefits. On the other hand, most sources saw cost-benefit analysis as a valuable tool in spite of its shortcomings. Wildavsky (1966) saw it as having a

definite place in economic analysis and commented, "the great advantage of cost-benefit analysis, when pursued with integrity, is that some implicit judgments are made explicit and subject to analysis" (p. 297).

Cost-Benefit Analysis in Education

The predominant use of cost-benefit analysis in higher education has been in the determination of the long-term value of education from the point of view of both the individual and society. Education in general and specific vocational or training programs have been scrutinized through the procedures of cost-benefit analysis.

Researchers became interested in examining the monetary costs and benefits of education when this new area of inquiry was spearheaded by T. W. Schultz in 1960 (Alexander, 1976). Schultz (1961) was one of the earliest economists to focus on the concept of human capital as a means of explaining rapid growth in the national output of some countries that could not be explained by increases in physical capital. Levin and Shank (1970) noted that Japan and various European countries devastated during World War II demonstrated remarkable recoveries that were due, in great extent, to "the economic power of accumulated and accumulating knowledge" (p. 37). Becker (1970) commented that "few, if any, countries have achieved a sustained period of economic development without having invested substantial amounts in their labor force" (p. 63).

Weisbrod (1966) noted that increases in physical capital accounted for only one-half or less of the United States' growth in

per capita output in this century. He labeled as "intangible capital" the labor resources made up by people (p. 6). Further, Weisbrod identified factors that would serve to increase the productive capacity of the worker. Among these factors are expenditures on information, labor, mobility, health, education, and training. In addition to the direct economic gains to the individual, he determined that the intangible benefits of education to society included such factors as the intergenerational value (the impact of educated parents on their children), crime prevention, decreased welfare costs, and the positive effects of an involved, educated citizenry.

Houthakker (1959) calculated the mean incomes associated with various levels of education and age. Although he found that individual income does increase with educational level, he cautioned against attributing this difference solely to the difference in educational level. Parental wealth and individual intelligence must also be considered as factors in these differences.

Hansen (1963) developed and utilized the internal monetary rate of return analysis to determine the costs versus benefits of schooling. He calculated the values for the resource costs as defined by Schultz (1961). These included such factors as salaries, supplies, interest and depreciation on capital, opportunity costs incurred by individuals (income foregone), and incidental costs such as books and travel. Benefits were determined from lifetime cost-income streams for each level of schooling. Finally, an internal rate of discount which

set the present value of the cost stream equal to the present value of the net return stream was estimated.

From the above calculations, which are generally considered as cost-benefit analysis, Hansen (1963) found a gradual increase in the rates of return with each subsequent year of schooling up to the eighth grade, then a gradual decrease in the rates of return to the completion of college.

More recently, the use of cost-benefit analysis in education was expanded into the general area of evaluation of vocational and technical manpower training programs at both the secondary and postsecondary levels. Barsby (1972) commented,

> it becomes apparent then, that evaluation of manpower programs is a necessary adjunct to their operation. Proper evaluation gives us a mirror that lets us see past results, allows us to compare relative success in achieving stated goals; it enables us to adjust the composition of existing programs and devise new ones to increase the efficiency with which the goals are reached. (p. 6)

The use of cost-benefit analysis in this area has served not only to determine the overall net present value or rate of return on a particular program, but to compare these figures among the various vocational programs. Again, the emphasis has been to compare the direct and indirect costs of the educational program with the lifetime benefits derived both privately and socially.

Several studies in vocational education are of interest. Barsby (1972) cited the study by Corazzini which compared cost-benefit ratios of students enrolled in similar vocational programs at the vocational high school level versus the junior college level.

Carroll and Ihnen (1967) compared the benefits of junior colleges to its graduates as opposed to the benefits enjoyed by high school graduates. Two studies conducted in Florida (Bobbitt, 1978; Harris, 1972) studied the costs and benefits of two vocational programs, air conditioning and heating mechanics and practical nursing.

Along these same lines, Philippon (1980) conducted a major study in which 12 nonuniversity training programs in the allied health field were evaluated for costs and benefits using measures of payback periods, net discounted present values, benefit/cost ratios, and internal rates of return. He found highly varied yields among these programs with several falling below the criterion of an acceptable rate of return. He further concluded that much more attention should be paid to costs and monetary returns of programs in addition to the "manpower" approach traditionally used.

While cost-benefit analysis has been widely used in education, Woodhall (1970) noted that there are some educators who are critical of its application in the field. "Some educationists have argued that cost-benefit studies are inapplicable to education, because of the multiplicity of educational objectives, and the importance of non-economic benefits" (p. 12). On the other hand, she summarized the view of most expert articles reviewed when she stated, "cost-benefit analysis cannot be the sole criterion for educational planning, but . . . such an analysis should be an important element in decision making" (p. 7).

Cost-Benefit Analysis in Health Care

A rapid rise in the frequency of use of cost-benefit analysis in recent years has paralleled national concern for escalating costs in health care. Tolpin (1980) noted that over half of the increase in health care expenditures is estimated to be due to increased prices. The concern over prices has been reflected in a growth in literature on cost-benefit and cost-effective analyses in medical journals which surpasses that found in nonmedical journals (Warner & Hutton, 1980).

According to Prest and Turvey (1965), Sir William Petty was one of the earliest researchers to apply cost-benefit analysis to the health field when he attempted to quantify the economic value of man. Hellinger (1980) linked the growth of cost-benefit analysis in health care with the increase in government involvement associated with the beginning of the Medicare and Medicaid programs in the mid-1960s. Further, he stated, "currently, the federal government is involved actively in testing and evaluating new medical technologies in an effort to contain the growth of health care costs" (p. 207).

Dittman and Smith (1979), in addition to Klarman (1974), gave a clear explanation of the dynamics which have led to the rapidly increasing costs in health care and the subsequent need for evaluative tools to help contain costs. They mentioned general market failures that limit the ability of the marketplace to allocate health care resources. Because of costs, some markets will fail to survive. Second, market efficiency depends on both the buyer and seller

knowing and understanding the full costs and benefits that are part of the transaction. This is not the case in health care where many consumers lack knowledge relative to the health care opportunities that are available. Finally, in health care there are many cases in which social benefits are greater than private benefits. In these circumstances the system cannot depend on private demand to make necessary services available.

There are circumstances within the health care system itself that "insulate providers and consumers of health services from market incentives" (Dittman & Smith, 1979, p. 46). The role of third party payers serves to isolate the consumer from direct financial responsibility for health care. In addition, the cost-based retrospective payment system provides no incentive for cost containment. Klarman (1974) noted, "in the case of hospitals, cost reimbursement for most patients leads to an impairment of financial self-discipline, since a dollar need only be spent in order to be gotten back" (p. 340). Finally, consumers and policy makers alike have been reticent to deal with the issue of cost versus quality. Difficult choices must be made as to how much "health" consumers are willing to finance. Tolpin (1980) explained,

> motivated primarily by pressures to curtail inflationary increases in health care costs, decision-makers in both the public and private sectors are being forced to make value judgments which explicitly recognize resource constraints and, therefore, imply trade-offs among efficiency, equity, and quality objectives. (p. 217)

Cost-benefit analysis is viewed as a valuable tool to help make decisions in these cases of market failure and to help set priorities within the health care sector.

The definition of cost-benefit analysis in the health care field is fairly consistent with that described earlier by economists. Klarman (1974) saw it as a means of comparing costs and benefits of alternative programs that are in competition for limited funds. Bootman, Rowland, and Wertheimer (1979) adopted the Prest and Turvey (1965) definition quoted earlier in this review for their discussion. And, finally, Hellinger (1980) defined it as a "technique used by decision-makers to choose among several courses of action" (p. 204).

The cost-effectiveness/cost-benefit delineation is also present in the health care literature. There is general agreement that cost-benefit analysis centers on dollar valuations of both inputs and outputs while cost-effectiveness analysis uses nonmonetary indicators of goal achievement (Dittman & Smith, 1979; Weinstein & Stason, 1977). It is also noted that in cost-effective analysis the end product is constant while the methods to reach the end goal vary and have different costs attached to them. The purpose is to find the least expensive method to reach the goal (Williams, 1974). While cost-benefit analysis is often associated with broader projects and cost-effectiveness is deemed useful in projects that are narrower in scope, Bootman et al. (1979) cautioned that both techniques can be applied either to very broad or very narrow problems.

In articles reviewed relative to cost-benefit analysis in the health care sector, benefits are frequently defined as costs deferred (Klarman, 1974). In other words, "direct benefits are

defined and measured by the cost of health resources that are freed by the achievement of a particular health status or health system goal" (Dittman & Smith, 1979, p. 52). Such benefits would be the dollar value placed on the time of physicians, nurses, and other health personnel, with the addition of money spent on drugs, supplies, and hospital equipment. Further, direct benefits would also include resources saved from future expenditures that would have been required for research and new treatment technologies. Williams (1974) viewed benefits somewhat differently and contended that they should be measured in terms of health, such as morbidity measures or mortality measures, or through a valuation of increased life expectancy. It becomes clear that the valuation of these benefits can become an extremely complex task.

Bootman et al. (1979), Dittman and Smith (1979), and Klarman (1974) cited as indirect benefits such factors as averted loss of earnings due to premature death or disability. Intangible benefits were described as the "psychic costs of disease," such as pain, suffering, and grief (Bootman et al., 1979, p. 138). In addition to the above are the spillovers or external benefits that society enjoys as a result of the eradication of some health problem.

A number of problems are noted in applying cost-benefit techniques to the health care sector. These problems can generally be considered as problems of classification and valuation. Klarman (1974) noted that it is difficult, in health care in particular, to separate the activities and services that go into the treatment of one problem or

disease from those services that are used in the treatment of another problem. This is particularly true in hospitals where departments offer similar services for a variety of illnesses. In addition, he cited the difficulty of formulating the expected outcomes of programs. This arises from the fact that medicine is not all science but entails a great deal of "art" as well.

Problems in valuation arise when attempts are made at assigning dollar values to human life and other intangible costs or benefits. Hellinger (1980) described two approaches to value human life. The "livelihood savings approach" uses the present value of future streams of income as the measure of the value of an individual's life. This point of view is criticized in that maximizing income is not really the goal of health care. The "willingness to pay approach" is the amount a person would be willing to pay to reduce the risk of contracting an illness by a specified amount. The problem with this approach is that the reliability of answers to such a question is in doubt. Both approaches, at best, yield crude measures. Hellinger expressed the opinion that, in spite of the drawbacks, one or the other of these methods is preferable to no formal analysis at all.

Costs and Benefits in Clinical Education Programs

The following review of costs and benefits of clinical education programs is focused on studies in both the medical and allied health fields where the attempt is to examine how time is spent by fieldwork students in their respective clinical placements and their impact on

the clinical setting from a costs/benefits point of view. A number of early studies, particularly those that investigated medical clerkships, were focused simply on how time was spent by students during the clerkship. In some cases these studies arose out of concerns expressed by medical students that they were being utilized more for "work," with little benefits received as far as their own educations. Although these studies are somewhat tangential to the major area of concern of the present research, such studies did set the methodological groundwork for the cost-benefit studies that followed.

Payson, Gaenslen, and Stargardter (1961) conducted one of the earliest studies on how time was spent by medical interns. Although it was a descriptive study limited to a local hospital, it established the use of a time log in determining how time was spent. The logs were kept by other students who were trained as observers for the purpose of the study and who followed the interns around continually during the data collection period. While the results can only be considered important for that hospital, it is interesting to note that a very small amount of the interns' time was devoted to direct contact with patients.

Later, Gillanders and Heiman (1971) carried out a similar study of medical interns in which time logs were also kept by student-observers. The purpose of this study was to compare time spent by the interns with the requirements set forth in the American Medical Association's "Essentials of an Approved Internship." The researchers

found the three hospital programs studied conformed broadly to the requirements of the "Essentials." Along these same lines, Arthurson, Mander-Jones, and Rocca (1976) used time logs kept by observers and found that an inordinate amount of time was spent by interns in clerical duties and little in direct patient interaction.

In 1981, LaPalio again studied time spent by interns but in this instance self-reported logs were used with comparisons made to questionnaires that were filled out by faculty members. He found that students were on duty for long periods of up to 32 hours at a time with little sleep. Like Arthurson et al. (1976), LaPalio found interns spending insufficient time with patients. More recently, LaPalio, Filling, Engel, and Ways (1983) studied clerkship experiences using three methods of data collection, i.e., daily logs, observations, and interviews. They found the combination of methods of data collection helpful in obtaining a wealth of qualitative as well as quantitative information relative to the clerkship experience.

In his 1972 article on the clinical costs of medical education, Wing summarized the scant research up to that time. He cited studies by Carr and Feldstein, Ingbar and Taylor, and McCorkle, all of which indicated increased costs per patient stay of teaching hospitals when compared to nonteaching hospitals of similar size and scope. A major weakness in these studies was made evident when Busby, Leming, and Olson (1972) reported on their study of teaching hospitals. They reported other factors, found concomitant with the teaching status of a hospital, that contributed to raising the per patient costs.

Among these factors were a higher medically indigent patient load; the operation of larger, more diverse, outpatient clinics; a lower occupancy rate; greater utilization of diagnostic services; and a higher nursing staffing expense.

Freymann and Springer (1973) provided the first indepth analysis of the costs and benefits of a clinical education program at Hartford Hospital. In this study, the researchers computed all the direct expenditures for educational programs in medicine, nursing, and allied health. In addition, indirect costs, such as administrative costs, depreciation, and public relations were also determined. On the benefit side, students were asked to keep a log of daily activities that would indicate the amount of time spent in hospital service activities, such as direct patient care. Based on these logs, the researchers calculated a proportion of these student-performed activities that were considered "hospital essential." Dollar values were assigned to these essential services based on the replacement costs of trained professional staff. It was concluded by Freymann and Springer that, even at this proportional level of services, the students provided manpower of a value that exceeded the costs of their educational programs.

The instructional costs of a required third-year primary clerkship were determined by Pawlson, Schroeder, and Donaldson (1979) through the use of faculty logs, direct observation, and on-site interviews. They calculated costs through time spent by both faculty and nonfaculty members, space and materials, and university

overhead. Costs of space and overhead were found to be marginal, thus faculty salaries constituted the primary expense. No attempts were made in the study to compare possible benefits generated by the students. The researchers determined that the overall costs per student of the clinical program totaled $11,500 per year, or $54.20 per day.

Subsequently, a second study by Pawlson, Watkins, and Donaldson (1980) was also focused on medical student instruction costs. This time they used measures of physician productivity as the indicator of student effect on the clinic setting. With baseline data kept when students were not present, the number of patient visits was used as the indicator of physician productivity. The authors explained the procedure used as follows:

> Where a significant difference in the number of visits with and without students present was found, the difference in mean visit productivity is used as a best estimate of productivity change. The difference is multiplied by the cost per visit to give the costs due to lost patient care productivity. (p. 848)

The results of this study indicated a significant loss in physician productivity for second, third, and fourth year medical students. Greater losses were noted when students were participating in patient care than when they just observed. No loss in productivity was noted with first year medical students where the student role was purely an observational one.

Cost-Benefit Studies in Allied Health

Keim and Carney (1975) contributed one of the earliest cost-benefit studies in allied health. Programs included in the study

were medical technology, occupational therapy, physical therapy, physician's assistant, radiologic technology, respiratory therapy, and social work. Concentrating on the clinical placement phases of these seven allied health programs, the researchers utilized group interviews with staff and students to determine perceived time spent in student supervision, administrative duties associated with the clinical placement, patient treatment, and other staff duties. All costs and benefits were valued according to full-time staff equivalencies.

In the occupational therapy program, costs were defined in terms of personnel time for instruction, administrative duties, miscellaneous expenses such as the provision of room and board for some students, and student stipends. Although space and equipment costs were reviewed, they were found to be insignificant. The frequency of providing room, board, and stipends was found in three or less of the 10 sites studied but were averaged and valued as though occurring in all the sites. Program benefits included revenue production as a result of increased patient treatment, the provision of nonprofessional labor, and such intangible benefits as recruiting advantages, staff incentives, and improved patient care.

Based on the data received from the interviews, the researchers concluded that costs of the occupational therapy fieldwork program could be equated to the personnel time of 1.3 registered occupational therapists (of which .1 was attributed to stipends and room and board). Conversely, the benefits through increased productivity

brought about by the student/supervisor team was evaluated to be about 130% of the therapist working alone. The authors concluded that there was no net cost or benefit to the clinical site.

While this study is important in its early thrust in applying cost-benefit evaluation techniques to clinical education programs, the lack of more reliable quantitative data is a major weakness. Consequently, the conclusions reached are questionable.

A study similar to that of Keim and Carney (1975) was conducted on physical therapy clinical education programs by Porter and Kincaid (1977). Again, questionnaires were utilized and information was requested from physical therapy department heads relative to the impact of their student programs. While costs and benefits were defined similarly to those of Keim and Carney, benefits relating to patient treatment were valued according to the treatment revenue generated. Comparisons were made between junior and senior level affiliating students with overall benefits being noted in both groups. Further, benefits as a result of senior level placement were greater than those realized with junior level placements.

Pobojewski (1978) compared the costs and benefits of clinical placement of radiologic technology students placed in a local hospital from a community college program. Again, costs and benefits relative to student supervision and patient treatment were based on estimates given by the department head. It was perceived by the department head that time spent in student supervision was highest in the early weeks of the fieldwork and gradually declined

throughout the year-long internship period. Pobojewski reported an estimated overall benefit of student placement in that facility in excess of $45,000.

In her study of the clinical placement of six junior college level allied health programs, Hammersberg (1982) surveyed supervisors and staff members to obtain estimates of the amount of time spent in educational activities and the cost of supplies needed for educational purposes. Student contribution to the daily work load constituted the benefit side of the equation. All data were obtained through the supervisors; no student responses were sought. Hammersberg found greater costs than benefits in all six of the programs she studied. It is of interest that Hammersberg noted in her article that many of the fieldwork sites where the college students were placed were beginning to demand a share of the tuition revenues for each student they accepted. Such demands are not surprising in light of the results of her study.

Leiken et al. (1983) utilized a somewhat different approach in their analysis of the impact of clinical education programs. Rather than delineating costs and benefits, they analyzed the production effects of student placement. Inputs were defined as the number of students and therapists present each day, outputs were determined by the number of daily patient charges. Data were obtained through a simple review of the hospital accounting and personnel records yielding data which were subjected to regression analysis. Occupational therapy, physical therapy, and radiology technology

programs were studied with students having a positive impact on productivity in all three areas.

Lapopolo (1984) studied the costs and benefits generated by physical therapy students in three large and three small hospitals within the San Francisco area. Time logs were kept by student supervisors to tabulate time spent in the categories of direct patient care, indirect patient care, administrative activities, personal time, student education, combined student/therapist direct patient care, and combined student/therapist indirect patient care. Dollar values were assigned based on charges for patient treatment and therapists' salaries. Lapopolo found that a daily benefit of approximately $89 was generated per student.

A cost-benefit analysis of occupational therapy fieldwork was conducted by Chung et al. (1980). The major cost in this study was attributed to the reduction in the production of agency services or personnel time. Additional costs, such as the provision of room, board, and student stipends, were also identified. However, because not all agencies provided these student perquisites, the researchers excluded them from the overall model indicating that their inclusion would "introduce inconsistency in the cost structure between different agencies and lead to a misleading conclusion" (p. 218). It was recommended that these costs be treated as additive or marginal costs in dealing with the individual agency's cost-benefit analysis.

Benefits were identified as revenue-producing activities (patient treatment), low cost labor for miscellaneous duties, and intangible

benefits such as those described in the Keim and Carney study (1975). The assignment of a discount rate was ruled out due to the subjectivity of the procedure.

Data were collected from students and supervisors by means of a daily log. This log provided information regarding daily investment by agency staff in instructional duties and daily investment on the part of the students in patient treatment and other miscellaneous duties. Instructional hours were valued according to the national average pay scale for professional occupational therapists.

Results of the study indicated that students contributed hours of work equivalent to slightly more than half of a full-time staff work load and "contributed 83.1% more man-hours than the agency relinquished of its staff time for the student" (Chung et al., 1980, p. 224). Since the value of the student labor was discounted based on their lack of full credentials and experience, the researchers concluded that the fieldwork sites were approximately "breaking even" with regard to their educational programs.

While the Chung et al. (1980) study is the most thorough cost-benefit analysis of clinical fieldwork to date, it did suffer from some serious problems. Attrition was extremely high. While 100 logs were sought from students and their supervisors, only 16 usable pairs were actually obtained. It is probable that daily data collection over a 13-week period was simply too intrusive into the fieldwork clinic routine. In addition, the discounting of the value of student

time would seem to give the study a conservative bias when calculating benefits since institutions will benefit on the scale of patient treatment revenues no matter who performs the treatment. Nevertheless, this cost-benefit research formed the basis of the present study that is reported here with adjustments made in methodology designed to compensate for the shortcomings mentioned.

Comments on the Literature Review

While cost-benefit analysis is widely accepted as a legitimate form of program evaluation, there are many problems associated with its implementation. Value judgments must be made in defining costs and benefits and assigning their values. The review of the literature indicates no clearly defined procedures to be followed in its implementation. Controversy exists relative to its definition, the determination of costs and benefits, and the assignment of discount rates, market values, and decision criteria. A great deal of subjectivity can enter into the process, yet the procedure does provide some structure for the analysis of programs in a systematic fashion.

The review of the literature has revealed widely variant applications of cost-benefit analysis. Broad applications of the method in the field of economics are tremendously different from the narrow applications in the allied health professions. Review of the allied health studies reveals extremely primitive applications in earlier research with marked improvement in the sophistication of more recent studies.

It is clear that scrutiny of expenditures in health care and education will continue as governmental agencies emphasize decreased expenditures for social programs. This emphasis on accountability and cost containment in public programs almost assures the continued use and refinement of cost-benefit analysis. The study presented herein is a further attempt at such application and refinement.

CHAPTER III
PROCEDURES AND METHODS OF ANALYSIS

The purpose of this chapter is to describe the planning and implementation of the research. It begins with a discussion of the background and setting of the study. This includes an overview of the accreditation requirements for an occupational therapy education program and fieldwork experiences, as well as a description of the structure and setting of the fieldwork assignment. This is followed by sections related to the (a) steps taken in the identification of costs and benefits, (b) recruitment of subjects, (c) method of data collection, and (d) statistical analysis of the data.

Related Background, Setting, and Population

The Essentials and Guidelines of an Accredited Educational Program for the Occupational Therapist (American Occupational Therapy Association [AOTA], 1983) describes the role of entry-level occupational therapy professional education as preparing the individual to

1. provide occupational therapy services to prevent deficits and to maintain or improve function in daily living skills and in underlying components; e.g., sensorimotor, cognitive, psychosocial.
2. manage occupational therapy service.
3. incorporate values and attitudes congruent with the professions' standards and ethics. (p. 2)

The "Essentials" further define professional occupational therapy education as taking place at a college or university authorized to grant baccalaureate or higher level degrees. Content requirements for occupational therapy professional education include coursework in liberal arts and sciences; biological, behavioral, or health sciences; and occupational therapy theory, practice, and application.

In conjunction with classroom and laboratory learning experiences, the essentials require associated, real-life fieldwork experiences. The Level I fieldwork experience serves to directly complement classroom experiences by providing "opportunities for directed observation and participation in selected clinical sites" (p. 3). Level II fieldwork requires the student to spend six months in supervised clinical practice which emphasizes "the application of an academically acquired body of knowledge" (p. 3). During the Level II fieldwork the student is expected to have experience with a wide range of client ages and types of illnesses or disabilities and to approach the performance level of an entry-level therapist (Commission on Education of the American Occupational Therapy Association, 1985).

Generally, a student is assigned to two three-month Level II assignments. Most often, one of these fieldwork assignments takes place in a psychiatric setting while the other emphasizes physical dysfunction, such as a general medicine or rehabilitation hospital. Other options for fieldwork placement include pediatric or geriatric settings or specialty programs such as hand therapy or home health.

In addition, the student may choose a third Level II fieldwork assignment to obtain additional experience in a particular area of interest.

The Level II fieldwork placements are managed at the university level by the academic fieldwork coordinator who arranges agreements between the university and selected fieldwork sites for the provision of clinical experiences. Depending on the size of the occupational therapy department at the clinical site, there may be persons designated to coordinate the clinical education program in addition to the direct supervisor who is responsible for supervising and evaluating student performance during the fieldwork experience. Most often, however, one person fills both of these roles.

The student supervisor rates student performance using a standard evaluation tool, the Fieldwork Performance Report, which was developed and is periodically revised by the Commission on Education of the American Occupational Therapy Association. This rating occurs at the midpoint and final week of the fieldwork experience (AOTA, 1983). A minimum performance rating is required on each of the two Level II fieldwork assignments and, after meeting this criterion (as well as successful completion of academic work), the student is permitted to "sit" for the national certification examination.

In 1984, within the United States, there were 56 accredited professional-level occupational therapy programs (AOTA, 1984a). Of these, two offered only the basic master's-level programs, while 10 offered both baccalaureate and basic master's-level educational programs, and 44 were solely baccalaureate programs.

Identification of Costs and Benefits

According to Prest and Turvey (1965), a cost-benefit analysis must first identify those factors that constitute the costs and benefits of a program and it must determine how these factors are to be valued. In this research, the direct costs identified with clinical fieldwork placement included the time spent by the supervisor and other professional staff in preparation for and supervision during the student placement. This included time spent in general one-to-one supervision of the student, meetings, preparation and administration of the fieldwork, and in formal teaching or instructional sessions. Benefits were derived from (a) the time spent in direct, independent, patient care that was administered by the student; and (b) the time spent by the student performing work that released the supervisor or staff for other duties. This included time spent in individual and joint patient treatment sessions, administrative work of the clinic, meetings, and in clerical or aide duties.

As has previously been noted, based on studies by Keim and Carney (1975) and Chung et al. (1980), the most significant costs and benefits were expected to be generated in personnel time. Costs such as space and overhead were viewed as minor and were not included. Because of inconsistency from site to site in the provision of room, board, and stipends for students, the inclusion of these factors in the overall cost-benefit calculation was viewed as inappropriate.

Time spent in supervision or instruction was valued according to the average charge per 15 minute unit of occupational therapy

treatment in the participating clinical facilities. This was justified by the point of view that time spent by the therapist in direct supervision of the student and associated activities would be available for patient treatment (and its corresponding income to the institution) if the student were not present.

Time spent by the student in direct patient treatment was also assigned a value based on the average per unit treatment charges. While it is not presumed that the student functions at the same level of effectiveness as the supervisor, from the institutional point of view, charges for time spent in patient treatment within the occupational therapy department are the same no matter who performs the treatment. However, in the case of group patient treatment, the student was credited only with the treatment of one patient per 15-minute increment, thus taking into consideration the student's lack of experience and assuming a certain amount of inefficiency on the student's part.

Student time spent on other professional duties, such as treatment planning and writing progress notes was valued at the rate per hour for a salaried therapist. This rate was justified by the fact that the student brings a certain amount of professional expertise to the fieldwork site as a result of the occupational therapy educational process at the academic institutions. The therapist functions of planning treatment programs, writing progress notes, and representing occupational therapy at meetings, require this expertise and therefore warrant valuation at a professional rate. On the other hand, time

spent in aide or clerical duties was valued at the minimum hourly wage since the replacement cost of providing these services would be at this level. While the values placed on student contributions were somewhat greater than those given by Chung et al. (1980), they were not inconsistent with values assigned by other researchers that were reviewed (Lapopolo, 1984; Leiken et al., 1983; Pobojewski, 1978; Porter & Kincaid, 1977).

Recruitment of Subjects

The recruitment of subjects for this research took place on two levels. Initially, educational program directors and their fieldwork coordinators were contacted to obtain their cooperation and endorsement of the study. Once endorsement was granted, contact was made with individual students and their supervisors to enlist their involvement.

First, a pilot study was conducted to determine the level of interest of occupational therapy educational program directors in participating in the research. This was conducted by mail using a cover letter and questionnaire format (see Appendix A). Approximately half of all the educational program directors were contacted. Included in this group were all basic master's-level program directors as well as bachelor's-level program directors that were judged by the researcher to be likely candidates for participation in the study. Based on responses to the questionnaires, it was determined that the level of interest warranted proceeding with the study on a national scale.

In further preparation for the study, the researcher attended the Annual Conference of the American Occupational Therapy Association which was held in Atlanta, Georgia, during April of 1985. Formal presentations were made to the meetings of academic fieldwork coordinators and clinical supervisors relative to the planning of the research and its implementation. Members in attendance at these meetings, which represented all academic occupational therapy programs in the United States, were invited to participate. In addition, the student representative assembly was also formally addressed to encourage participation of the individual student members.

As a result of the recruitment efforts, representatives of 16 educational programs expressed willingness to participate. Of these, the necessary information (e.g., student names, fieldwork locations, and names of fieldwork contact persons) was provided by 12 programs prior to the beginning of the summer fieldwork period and thus constituted the final group of educational programs included in the study.

Participating basic master's degree granting programs were Texas Women's University, The University of North Carolina, The University of Southern California, Virginia Commonwealth University, and Western Michigan University. Bachelor's degree granting programs included Eastern Michigan University, Medical College of South Carolina, The Ohio State University, San Jose State University, The University of Alabama at Birmingham, The University of Florida, and The University of Wisconsin at Madison. A total of 384 students from these 12

programs were sent to Level II fieldwork assignments between May and September of 1985. There were approximately 2,000 students engaged in Level II fieldwork during this period from the accredited programs in the United States; the 384 students in the study represented approximately 20% of the total population of students assigned to fieldwork.

Fieldwork coordinators from participating educational programs were asked to endorse the study and to join in an introductory letter requesting participation from their students and fieldwork supervisors (see Appendix B). They provided lists of students who were assigned Level II fieldwork during the summer affiliation period. Names and addresses of the fieldwork sites as well as the contact person or student supervisor at the site were also provided.

All fieldwork students and their supervisors from the above programs were contacted to participate in the study. This initial contact consisted of the introductory letters (described above) plus the first two time logs and instructions for their completion. While students and supervisors were urged to complete the logs and return them, participation was completely voluntary. All students and supervisors who provided one or more pairs of time logs were included in the study.

With each student and corresponding supervisor making up a dyad, responses from a total of 264 student/supervisor dyads were returned. Of these, 230 paired responses were received; that is, both the student and supervisor completed time logs from at least

one week of the affiliation period and returned them. Four of the 230 paired responses were eliminated from the data set due to grossly overestimated time expenditures (totaling well over the usual 40-hour work week). For purposes of statistical analysis, additional observations were deleted yielding a total of 181 pairs of time logs. (See the Data Collection section for a description of the steps involved and rationale for paring the data set from 226 to 181 observations.)

Method of Data Collection

Instruments for Data Collection

Two time logs and instructions for their completion were prepared by the researcher. These logs were developed using models from the previous cost-benefit study by Chung et al. (1980). They were used to collect data from the student and supervisor relative to time spent in patient treatment and student supervision respectively. The fieldwork supervisor log included categories of time expenditures in general supervision, meetings, preparation and administration of the student program, and formal instructional sessions. The student time log had entries for time spent in independent and joint patient treatment, administrative work, meetings, and clerical or aide duties.

The logs were utilized on a trial basis by occupational therapy students and their supervisors residing in the vicinity of Gainesville, Florida, to assure understandability and usefulness. The logs were also shown to representatives from the participating educational programs. Clarification and adjustments were made in response to

specific criticisms and suggestions made by these individuals. Examples of the student and supervisor time logs and their instructions may be found in Appendix C.

A site questionnaire was developed and sent to the clinical coordinators of participating fieldwork sites with the provision that it could be returned without identification (or anonymously). The primary purpose of the site questionnaire was to determine annual salaries of participating student supervisors and the hourly patient treatment charges in the fieldwork sites in order that the average of these values could be used to calculate net present value. In addition, as can be noted by a review of the site questionnaire in Appendix D, additional data were sought to determine the frequency in which stipends and room and board were provided to students and the possible added institutional costs associated with providing these student perquisites.

Data Collection

Each student/supervisor pair was asked to complete the time log for three one-week periods throughout the fieldwork placement. Weeks of data collection were assigned as follows:

1. Student/supervisor dyads were randomly assigned a number from one to four.

2. This number indicated which week, of the first four weeks of the fieldwork period, the first time log was to be completed.

3. Once the first logging week was established, the final two logging weeks were assigned the fourth and eighth week after the

first log. For example, when the number 2 was assigned a student/supervisor pair, then logs for that pair were requested for the second, sixth, and tenth weeks of the fieldwork period.

By assigning data collection according to this method, it was believed that the requirements of the research were met by adequately sampling time expenditures throughout the fieldwork period. At the same time, intrusion into the daily routine of supervising therapists and their students was kept at a minimum.

Requests for data were sent in two separate mailings. In the first mailing the letter requesting participation in the study plus the first two sets of time logs with instructions were sent. The second mailing included a cover letter with the final time log and site questionnaire. Two different cover letters were written for the second mailing with content directed to those who had or had not returned the initial time logs. Samples of these final cover letters are found in Appendix E.

As mentioned earlier, a total of 384 student/supervisor pairs were contacted and asked to complete the data sheets. Responses were obtained from 264 of the student/supervisor dyads. Since calculation of the net present value was dependent on paired responses showing both benefits and costs, it became necessary to discard unpaired responses from 34 participants. This yielded a remaining total of 230 student/supervisor paired responses, or a 60% return rate. Four of these pairs were unusable due to large gaps in data or grossly overestimated time expenditures.

The reader will recall that requests were made for three one-week observations from each student/supervisor dyad. However, there was variation in the number of responses received from these dyads with many sending one or two rather than the three requested time logs. As a result, it became necessary to reduce the number of time logs used in the statistical analysis so that just one observation per student/supervisor dyad was used thus avoiding errors stemming from repeated measures from some, but not all, subjects.

The paired responses from each student/supervisor dyad were listed together in sequential order (e.g., first observation, second observation). These responses were then further grouped according to the educational program with which the student was affiliated so that all student/supervisor observations from a particular educational program were listed together. Observations were then sequentially selected from the first (weeks 1 through 4), second (weeks 5 through 8), and third (weeks 9 through 13) periods of data collection with only one observation selected from each student/supervisor dyad. Data that did not fall into the sequence were deleted. The following list illustrates this method of sampling.

Student/Supervisor Pair #	Period of Observation	Week of Data Collection
A *	1	2
A	2	6
B *	2	8
C	1	1
C	2	5
C *	3	9
D	3	10

* indicates observations included in the final sample.

In the preceding example, pair "A" had completed time logs for the second and sixth weeks of the fieldwork (from the first and second periods of data collection). The first observation was selected to retain in the data set. Pair "B" returned only the second time log and, since this observation falls into the 1-2-3 sequence, it also was retained in the data set. Pair "C" returned all three logs and, since the third log fits into the sampling sequence, it was retained for the analysis. Pair "D", however, returned only the third log. This was out of the sampling sequence (a log from the first four weeks was required) and, therefore, was deleted from the data set. This sampling method yielded a final total of 181 pairs which were then subjected to statistical analysis.

Data Analysis

Processing the Data

Information from the time logs was totaled into cost (time spent by the supervisor) and benefit (time given by the student for patient treatment and other duties). The costs were multiplied by the average hourly charge for treatment in the participating clinical sites, or

$$C = T(G+M+P+I)$$

where

C = Cost
T = Hourly treatment charge
G = General one-to-one supervision
M = Meetings
P = Preparation and administration
I = Formal instructional sessions

Benefit was determined by multiplying time spent in patient treatment (both individual and group) by the hourly treatment charge, time spent in meetings and administrative duties by the average therapist's hourly salary, and time spent in clerical or aide duties by the minimum wage. This is more clearly represented by the following formula:

$$B = T(PI+PJ)+S(A+M)+W(D)$$

where

B = Benefit
T = Hourly treatment charge
PI = Individual patient treatment (time)
PJ = Joint or group patient treatment (time)
S = Average hourly salary for an occupational therapist
A = Administrative work (time)
M = Meetings (time)
W = Minimum wage
D = Clerical or aide duties (time)

The net present value (NPV) for each student/supervisor pair was determined by subtracting the cost as calculated above from the benefit.

$$NPV = B - C$$

A positive value indicated an overall benefit in the student/supervisor pair, while a negative value NPV indicated an overall cost for that week of observation.

Statistical Analysis

The reader will recall there were two basic questions which gave direction to the study. The first was, is there a cost or benefit accrued by clinical fieldwork sites as a result of occupational

therapy Level II bachelor's-level student placement, basic master's-level student placement, and bachelor's-level and basic master's-level placements combined? In order to answer this question, simple descriptive analysis of the data in the questionnaires and fieldwork time logs was carried out.

Results from the site questionnaires, returned anonymously, were used to determine the average salary paid to occupational therapists who participated in the study (the clinical supervisors) and the average charge for one hour of treatment in the clinical sites. This information, in turn, was utilized in calculating the dollar value of time spent by students and supervisors and, subsequently, arriving at the net present value of the fieldwork assignment.

As mentioned in the previous section, the total cost, consisting of the dollar value of time spent in direct supervision, teaching, meetings, and administration was subtracted from the total benefit, consisting of the dollar value of direct and joint treatment, administrative duties, meeting attendance, and clerical/aide duties. This calculation resulted in the net present value, or NPV, for each student/supervisor pair. Mean weekly NPVs were determined for bachelor's-level fieldwork, master's-level fieldwork, and overall fieldwork (both groups combined). A negative mean NPV was indicative of greater cost than benefit in the fieldwork, while a positive mean NPV indicated that the fieldwork placement generated a financial benefit to the clinical sites. These calculations served to answer the first question posed in the research.

Of concern in the research was the influence of degree level (bachelor's or basic master's) on the net present value of the fieldwork placement. It was also suspected that other factors, in addition to degree level, might also have an influence on the NPV. Age, for example, might be related to a higher NPV since the greater life experiences and maturity of the older students might enable them to function more independently thus bringing greater financial benefit to the fieldwork site. Along these same lines, students on their second or third fieldwork assignments might also generate greater benefits than those in their first fieldwork placements. The type of fieldwork placement was also viewed as having a possible effect on the NPV. It is conceivable, for example, that certain types of fieldwork placement, more than others, would encourage (or restrict) independent student activities thereby affecting the NPV. Finally, the cost or benefit realized might also be related to the week of fieldwork. As the student becomes more familiar with the fieldwork site and the assignments involved, it is realistic to expect increased benefit for the clinical site as a result of the student's presence.

In order to take into consideration the influence of such factors, a special analysis of covariance application of multiple regression analysis was used. This method of analysis enables one to model an interval dependent variable (in this case, NPV) "in terms of both interval level and categorical independent variables"

(Agresti & Agresti, 1979, p. 458). Analysis of covariance as a regression procedure is useful in testing the significance of differences between group means after controlling for initial mean differences on covariates or concomitant variables (Kerlinger, 1973; Kerlinger & Pedhazur, 1973). Covariates included in the analysis were (a) age of student, (b) type of fieldwork experience, (c) number of fieldwork experiences of the student, and (d) the week of fieldwork in which data were collected. More specifically, the multiple regression analysis was utilized to determine the significance of each of the independent variables in predicting net present value while simultaneously controlling for the other covariates. This analysis served to answer the second question that was posed in the planning of the research.

The following equation represents the full regression model for analysis:

$$Y = \alpha + B1X1 + B2X2 + B3X3 + B4X4 + B5X5 + B6X6 + B7X7 + B8X4 + \varepsilon$$

where

Y = net present value
α = constant
X1 = age of student
X2 = dummy variable for degree level (1, if bachelor's; 0, if master's)
X3 = number of fieldwork experiences student has had
X4 = week of fieldwork
X5, X6, and X7 = dummy variables for type of fieldwork (physical dysfunction, psychiatry, pediatrics, and geriatrics)
X8 = quadratic variable for week of fieldwork
ε = error
B1 . . . B8 = coefficients for the independent variables and the quadratic variable

As preliminary procedures to the regression analysis, certain tests were implemented to check for violations of the assumptions of normality, homoscedasticity, and linearity. In addition, testing for interaction between the variables is a procedure required in analysis of covariance. This testing involved the construction of a number of residual scatter plots prior to the multiple regression procedures. In addition to the examination of scatter plots, a quadratic variable was added to the regression equation above and the regression analysis since a curvilinear relationship between week of fieldwork and the dependent variable was highly suspected.

Following are the operational null hypotheses related to question 2 that were tested at the .05 level. Hypotheses 1 through 3 test for the significance of the covariates age, degree level, and number of fieldwork experiences in predicting NPV. Hypothesis 4 tests for the presence of the curvilinear relationship between week and NPV, while hypothesis 5 tests the significance of increase in the coefficient of determination when the different types of fieldwork (dummy variables X5, X6, and X7) are added to the regression analysis.

1. Controlling for the covariates degree level, number of fieldwork experiences, type of fieldwork, and week of fieldwork, age of student is not a predictor of net present value.

2. Controlling for the covariates age, number of fieldwork experiences, type of fieldwork, and week of fieldwork, there is no difference in the mean net present values between bachelor's-level and basic master's-level students. (H0:B2=0)

3. Controlling for the covariates age, degree level, type of fieldwork, and week of fieldwork, there is no difference in the net present values between the number of fieldwork experiences. (H0:B3=0)

4. Controlling for the covariates age, degree level, number of fieldwork experiences, and type of fieldwork, there is no curvilinear relationship between week of fieldwork and the NPV. (H0:B8=0)

5. Controlling for the covariates age, degree level, number of fieldwork experiences, and week of fieldwork, there is no difference in the net present values for students in different types of fieldwork placements. ($H0:R^2FM-R^2RM=0$)

A rejection of null hypothesis 5 would indicate further hypothesis testing as follows:

5a. Controlling for the covariates, there is no significant difference between the adjusted means for physical dysfunction fieldwork placements and pediatric placements. (H0:B5=0)

5b. Controlling for the covariates, there is no difference between the adjusted means for physical dysfunction placements and psychiatric placements. (H0:B6=0)

5c. Controlling for the covariates, there is no difference between the adjusted means for physical dysfunction placements and geriatric placements. (H0:B7=0)

The data were analyzed through the use of an IBM 3033N computer located at the Northeast Regional Data Center, utilizing the

Terminal Computer Package (TCP) operating system (Northeast Regional Data Center, 1982). Statistical analysis was carried out using the SAS statistical analysis package (Helwig, 1983; SAS Institute, 1985). Appendix F shows the computer program cards as they were set up for the data analysis.

CHAPTER IV
RESULTS AND INTERPRETATION

In the present chapter, the results of the descriptive and multiple regression analyses are presented. A summary of responses to the site questionnaire is given in the first section because the calculation of the net present value (NPV) was dependent upon information received from this source. This is followed by an overview of the participant responses, which includes a description of the distribution of participants within the educational programs that cooperated with the study. Next, the results of the calculations of overall weekly mean net present values as well as the weekly mean NPVs for bachelor's-level and basic master's-level placements is presented in order to address the first question of the study. In addition, tables showing mean weekly net present value (the dependent variable) on each of the independent variables (age of student, degree level, type of fieldwork, number of fieldwork experiences, and week of fieldwork) are included.

The third part of the chapter focuses on the second question of the study and presents the results of the multiple regression analysis. This includes the tests for violations of assumptions of the regression analysis, the polynomial variable, and the

significance of each of the independent variables in their prediction of the NPV (Kerlinger & Pedhazur, 1973).

Site Questionnaire Responses Relative to Charges and Salaries

Site questionnaires were returned from 167 clinical fieldwork locations. Of these sites, 149 provided information relative to the yearly salary of supervising occupational therapists, and 95 provided estimates of the hourly occupational therapy treatment charges. A number of the site respondents were unable to provide information relative to hourly treatment charges since costs for occupational therapy were included in an overall per diem charge for the hospital treatment. This appeared to occur most frequently in responses from psychiatric facilities.

In order to be used in the computation of NPV, the values for salary and treatment charges were averaged with the annual salary prorated to an hourly figure. For the sites participating in the study, the average hourly treatment charge was found to be $61.35 and the average hourly therapist salary was $11.38. These results were then inserted into the formulas used to calculate the NPV for each student/supervisor pair. Results of the calculations for the cost, benefit, and NPV of the individual student/supervisor pairs are listed in Appendix G.

Descriptive Analysis

Of the 181 student/supervisor pairs (dyads) included in the statistical analysis, 130 were from pairs with bachelor's-level

students and 51 were from pairs with basic master's-level students. Table 1 depicts the number of student/supervisor pairs that responded from each participating educational program compared to the total pairs per program. Number of pairs per program ranged from a low of 4 from the University of North Carolina to a high of 28 from The Ohio State University.

Means and standard deviations were calculated on the overall NPV across all levels of the independent variables, as well as the NPV for each condition of the independent variables. Results of these calculations are presented in Tables 2-6.

The first question put forth in this research was, is there a cost or benefit accrued by clinical fieldwork sites as a result of occupational therapy Level II bachelor's-level placement, basic master's-level placement, bachelor's and basic master's-level student placements combined?

The results of the analysis clearly indicate that the clinical sites derive a financial benefit from Level II fieldwork placement of both bachelor's and basic master's-level students in their facilities. Table 2 shows an average weekly benefit of Level II fieldwork of the combined bachelor's and basic master's-level fieldwork amounting to approximately $397. When the weekly NPVs shown in Table 4 are added together, the average benefit for a 13-week fieldwork placement is approximately $4850, or $4700 for a 12-week placement.

Table 1

Number of Student/Supervisor Pairs from Each Educational Program

Program	Degree (B or M)	Pairs Participating (N=181)	Pairs in Program (N=384)
Eastern Michigan University	B	23	49
Medical University of South Carolina	B	9	20
Ohio State University	B	28	58
San Jose State University	B	19	42
Texas Women's University	M	20	40
University of Alabama	B	8	26
University of Florida	B	20	28
University of North Carolina	M	4	10
University of Southern California	M	7	16
University of Wisconsin-Madison	B	23	51
Virginia Commonwealth University	M	10	21
Western Michigan University	M	10	23

Table 2

Overall Weekly Mean NPV (expressed in dollars)

N	Mean	Standard Deviation	Minimum Value	Maximum Value	Standard Error of the Mean
180	397.02	639.56	-1413.00	2069.00	47.66

Table 3

Weekly Mean NPV (expressed in dollars) by Degree

Degree	Mean	Standard Deviation	Minimum Value	Maximum Value	Standard Error of the Mean
Bachelor n=129	389.07	648.42	-1413.00	2069.00	57.09
Master n=51	417.12	622.41	-694.00	1679.00	87.15

Table 4

Overall Weekly Mean NPV (expressed in dollars) by Week of Fieldwork

Week	Mean	Standard Deviation	Minimum Value	Maximum Value	Standard Error of the Mean
Week 1 n=12	-462.75	388.12	-986.00	340.00	112.00
Week 2 n=13	-175.31	559.17	-976.00	712.00	155.00
Week 3 n=17	156.35	507.35	-637.00	1099.00	123.00
Week 4 n=17	107.59	680.04	-1413.00	1494.00	164.90
Week 5 n=12	595.75	536.38	-379.00	1265.00	154.80
Week 6 n=16	212.68	598.84	-694.00	1647.00	147.70
Week 7 n=15	664.93	562.06	-56.00	2069.00	145.10
Week 8 n=18	686.00	406.70	5.00	1432.00	95.85
Week 9 n=16	858.06	492.48	160.00	1679.00	123.10
Week 10 n=18	617.11	414.67	25.00	1375.00	97.73
Week 11 n=15	720.87	650.62	-475.00	1934.00	167.90
Week 12 n=8	731.25	484.06	156.00	1668.00	171.10
Week 13 n=3	144.67	399.13	-305.00	457.00	230.40

Table 5

Weekly Mean NPV (expressed in dollars) by Number of Fieldwork Experiences

Experience	Mean	Standard Deviation	Minimum Value	Maximum Value	Standard Error of the Mean
First n=116	381.85	629.24	-986.00	2069.00	58.42
Second n=57	440.23	651.27	-1413.00	1934.00	86.26
Third n=3	88.00	196.85	-138.00	222.00	113.60

Note. There were four responses with no designation for number of fieldwork experiences.

Table 6

Mean NPV (expressed in dollars) by Type of Fieldwork

Type	Mean	Standard Deviation	Minimum Value	Maximum Value	Standard Error of the Mean
Physical Dysfunction n=77	520.47	734.50	-1413.00	2069.00	83.70
Pediatric n=8	63.63	388.99	-694.00	659.00	137.50
Psychiatry n=91	315.57	547.60	-986.00	1347.00	57.40
Geriatric n=4	540.25	688.14	-475.00	1014.00	344.00

Table 3 shows average weekly NPV broken down into bachelor's and basic master's-level fieldwork. These results indicate a positive value NPV (or benefit) at both educational levels. Average weekly benefit of bachelor's-level placement came to $389.07, while the average weekly benefit of master's-level placement was $417.12.

Tables 4, 5, and 6 further illustrate the relationship between the NPV and the different levels of the independent variables week of fieldwork, number of fieldwork experiences, and type of fieldwork. Table 4 demonstrates that early in the fieldwork experience, the fieldwork assignments were costly to the clinical sites as indicated by the negative NPVs for weeks 1 and 2; in the succeeding weeks the NPVs became positive, reaching a high of $858.06 in week 9. The last week (or exit week) of the 12-week fieldwork assignments ended with an average NPV of $731.25 from eight student/supervisor pairs. The median of this group of observations was $642. The mean NPV in the last week in a 13-week fieldwork experience was $144.67, with a median of $282 in the three pairs included in this group. The difference in these two exit weeks may simply be due to the low n in the 13-week group (only three pairs) causing skewing of the data. On the other hand, there may be some real differences existing between the final week of the 12-week versus the 13-week fieldwork placements. Further research with greater numbers of subjects in both groups would be required to determine the nature and extent of possible differences between the two groups.

Tables 5 and 6 indicate that different NPVs were found depending on the number of fieldwork experiences the student had and the type of fieldwork experience encountered. For example, students in their first fieldwork experience had an average NPV of $381.85 per week, while students in their second fieldwork experience had a weekly average NPV of $440.23. Students in their third fieldwork experience had an average NPV of $88; it must be noted that two of the three observations in this group occurred in the first two weeks of the fieldwork, yielding a low (and somewhat misleading) NPV. In addition, students in physical dysfunction clinical sites had an average NPV of $520.47, while results from students in pediatric clinical sites demonstrated the lowest weekly NPV for the different types of fieldwork with an average of $63.63.

The final variable of interest in the study was student age. As mentioned previously, it was of interest because of the possible influence on the NPV brought about by the increased life experiences and maturity of the older students. Student respondents ranged in age from 22 to 45 years of age. The mean student age was 25 years, the mode was 22, and the median age was 23.

Multiple Regression Analysis

The second question to be answered by this research was, when other selected relevant variables are held constant, to what extent are there differences in the NPV in (a) bachelor's and basic master's-level placement, (b) week of fieldwork experience, (c) type of fieldwork, (d) number of fieldwork experiences, and (e) age of student?

In order to answer this question a special analysis of covariance application of multiple regression analysis was used and five basic null hypotheses were projected. The results of the regression analysis are reported in this section. They are preceded by the results of the testing for violations of assumptions which must be evaluated when using this statistical analysis.

Testing of Assumptions

The scatter plots that were constructed showed no major violations of the assumptions of normality, homoscedasticity, or linearity. No interaction was found between the covariates. However, results of previous research by Chung et al. (1980) indicated the presence of a curvilinear relationship between week and the net present value. On the basis of earlier findings, the quadratic model was used for the statistical analysis in spite of a normal-appearing scatter plot. (Results indicated that this approach was justified since the coefficient on the quadratic variable listed in Table 7 was found to be significant at the $p < .05$ level.)

The scatter plots were also used to determine the presence of outliers. One outlier was found and eliminated from the data set based on the fact that its residual was well beyond four standard deviations from the regression line (Younger, 1979).

Testing the Null Hypotheses

Using the SAS computer subprogram REG, the data were analyzed to determine the significance of each of the independent variables in predicting the net present value. The probability of a Type I error was preset at .05. Total number of subjects in this analysis was 173 after 7 observations were excluded by the computer because of missing data and the one outlier mentioned earlier was eliminated from the data set. Table 7 lists the results of the computer analysis.

Of the independent variables that were built into the model, the variables number of fieldwork experiences, type of fieldwork, and week of fieldwork were found to be statistically significant in the prediction of net present value. On the other hand, the age of the student and degree level were found not to be significant in predicting NPV.

More specifically, the variable "age of student" was found to be unrelated to the net present value ($p < .7553$). In other words, whether the student was older or younger had no particular relationship to whether the fieldwork placement was a cost or benefit to the clinical site. The lack of significance of this variable supports the retention of null hypothesis 1.

Moreover, the results indicate that the degree level of the student, either bachelor's or master's, bore no relationship to the resulting NPV. While the descriptive data showed a slightly higher NPV for master's-level students, the statistical analysis

Table 70

Results of the Multiple Regression Analysis

Source	Df	Sum of Squares	Mean Square	R-Square
Regression	8	23150884	2893861	.335
Error	164	45949790	280182	
Total	172	69100674		

Parameter	Estimate	Standard Error	p Value
Intercept	-859.10	333.70	.0109
Age	2.78	8.92	.7553
Degree	-74.42	101.62	.4650
Fieldwork experience	194.64	87.61	.0277*
Week	290.89	52.61	.0001*
Week 2 (polynomial)	-15.20	3.90	.0001*
X5 (Ped-PD)	-605.91	219.79	.0065*
X6 (Psy-PD)	-166.07	84.34	.0506
X7 (Ger-PD)	-144.40	277.02	.6029

Note. *p < .05
PD - physical dysfunction fieldwork
Ped - pediatric fieldwork
Psy - psychiatric fieldwork
Ger - geriatric fieldwork

reveals no significant difference between the two groups ($p <$ .4650). These results indicate that null hypothesis 2, which states that when controlling for the other variables there is no difference in the mean net present values between bachelor's and basic master's-level students, should be retained.

The results indicate a significant, direct relationship between the number of fieldwork experiences and the net present value ($p <$ .0277). That is, students who are on their second or third fieldwork assignments bring greater financial benefits to the fieldwork sites than are students who are on their first fieldwork assignments. The parameter estimate for number of fieldwork experiences in Table 7 shows that when the other variables are controlled, students in their second fieldwork assignments can be expected to generate approximately $194 more in weekly benefits to the clinical sites than those in their first fieldwork assignments. The significance of the variable "number of fieldwork experiences" serves to reject null hypothesis 3 which states that when controlling for the covariates age, degree level, type of fieldwork, and week of fieldwork, there is no difference in the net present values between the number of fieldwork experiences.

The week of fieldwork was found to be a strong predictor of NPV with significance found at the .001 level. A curvilinear relationship exists between this variable and the NPV, as indicated by the significant coefficient on the polynomial variable Week 2. The nature of the general relationship between week and NPV is

clearly depicted in Figure 1, where a hypothetical case is taken in which the age is set at 22, the fieldwork placement is in a physical dysfunction setting, with bachelor's-level students in their first fieldwork assignment.

As illustrated in Figure 1, the NPVs begin to take on positive values at approximately the third week of the fieldwork, indicating that when other variables are controlled, the fieldwork placement begins to bring about a dollar benefit by the fourth week. The NPVs tend to increase for the next several weeks, then they level off and decline. The decrease in benefit in the 12th and 13th weeks of the fieldwork may be related to the conclusion of the fieldwork itself, when supervisors are required to increase their time investment in student evaluation procedures and students are disengaging from patient treatment activities.

While the shape of the curve would be expected to remain unchanged, students on their second or third fieldwork experiences would be expected to bring about a benefit earlier in the fieldwork placement and, as is explained in reference to null hypothesis 5, students in pediatric fieldwork placements would be expected to show a benefit later in the fieldwork placement. The results of the above analysis support the rejection of null hypothesis 4 which states that when controlling for the covariates age, degree level, number of fieldwork experiences, and week of fieldwork, there is no curvilinear relationship between week of fieldwork and the NPV.

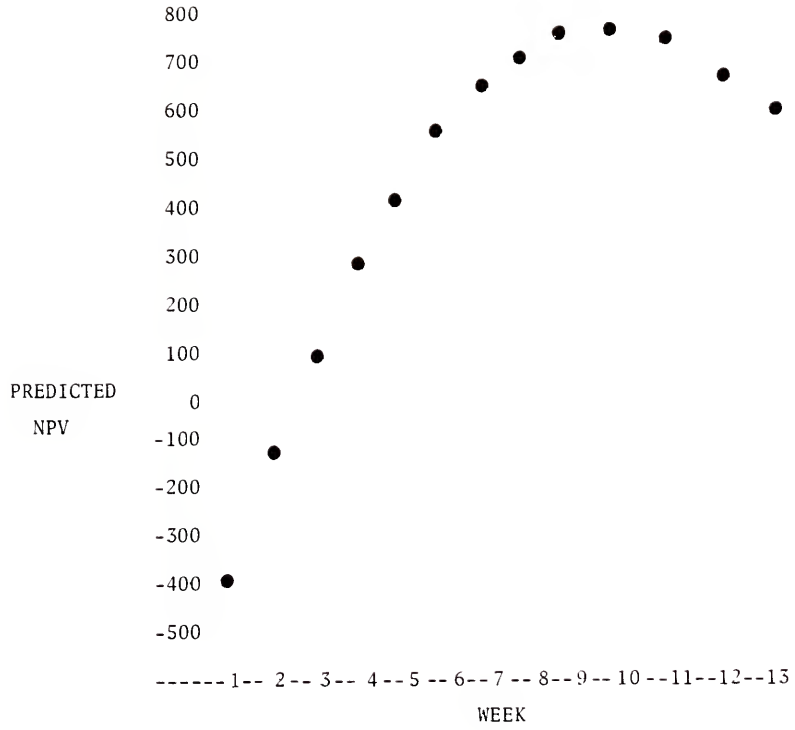

Figure 1. Relationship of Week to NPV when other variables are held constant.

Note. Age=22, physical dysfunction fieldwork, bachelor's level students, first fieldwork experience.

Finally, the analysis reveals that there is a relationship between the type of fieldwork experience and the resultant benefit to the clinical site. The significance of the qualitative variable, "type of fieldwork," was evaluated using an F test on the relative increase in the coefficient of multiple determination (increase in R^2) between the full model with the four levels of "type of fieldwork" variable included and the reduced model without the "type of fieldwork" variable. A significant increase in the R^2 indicates significance in the type of fieldwork as a predictor of the NPV. Table 8 lists the results of this analysis.

Table 8

Test of Significance: Type of Fieldwork

Model	R^2	F	Df
Full (With type of fieldwork included)	.3350		
Reduced (Without type of fieldwork)	.2962		
Difference (Full-Reduced)	.0388	3.19*	3, 164

*$p < .05$

The significant increase in R^2 as a result of the inclusion of type of fieldwork in the regression model serves to reject null hypothesis 5 and requires examining more closely differences between

the types of fieldwork (null hypotheses 5a, 5b, 5c; parameters X5, X6, and X7 shown in Table 7). The comparison of physical dysfunction fieldwork placements with each of the other types of placements (pediatric, psychiatric, and geriatric) resulted in a significant difference only between physical dysfunction and pediatric placements. An average difference in NPV of approximately $606 per week of fieldwork was found between physical dysfunction and pediatric fieldwork assignments with physical dysfunction providing the greater benefit. It is also interesting to note, however, that while no significant difference was found between physical dysfunction assignments and psychiatric assignments, the criterion for significance was missed by a very small amount ($p < .0506$). With reference to null hypotheses 5a, 5b, and 5c, these results support the retention of hypotheses 5b and 5c and the rejection of 5a.

CHAPTER V
SUMMARY, CONCLUSIONS, LIMITATIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

Summary

The primary purpose of the study was to determine whether the placement of Level II occupational therapy fieldwork students in clinical facilities brings about a net cost or benefit to the facilities. The secondary purpose was to determine what other factors are related to the costs or benefits of fieldwork placement.

More specifically, there were two basic questions to be answered by this study.

1. Is there a cost or benefit accrued by the clinical fieldwork sites as a result of occupational therapy Level II bachelor's-level placement, basic master's-level placement, and bachelor's-level and basic master's-level student placements combined?

2. When other selected relevant variables are held constant, to what extent are there differences in the NPV in (a) bachelor's and basic master's-level placement, (b) week of fieldwork experience, (c) type of fieldwork, (d) number of fieldwork experiences, and (e) age of student?

In relation to the second question, five basic null hypotheses were projected.

Subjects for the study were recruited from 12 occupational therapy education programs in the United States. Seven of these programs were bachelor's-level, five were basic master's-level. Participants were the students from these programs assigned to Level II fieldwork during the summer of 1985, and their respective clinical supervisors in the fieldwork sites.

A means of measuring costs and benefits was developed through the use of time logs which were designed to measure time investment in preparation, planning, and direct student supervision on the part of the student supervisor (costs), and in direct patient treatment and performance of clinic duties on the part of the students (benefits). These logs were developed using earlier logs from previous research as models. In addition, a site questionnaire was also developed to provide needed information to attach dollar values to the various aspects of costs and benefits of clinical placement.

Information concerning the time expenditures of the students and supervisors was obtained by sampling different weeks of the fieldwork placements. Each student/supervisor pair was asked to complete logs for up to three different weeks of the fieldwork period. It was necessary to receive at least one complete pair of logs (both student and supervisor logs returned with data collected for at least one week) for the data to be used in the final analysis. A total of 181 student/supervisor pairs met this criterion and were included in the analysis. Two basic forms of analysis were used.

First, descriptive analysis was used in question one, and a covariate form of multiple regression analysis was used to answer question two.

From the descriptive statistics calculated on the raw data, it was found that the average weekly NPV for bachelor's-level students was $389.07; for basic master's-level students it was $417.12; and for bachelor's and basic master's-level students combined it was $397.02. Since all are positive values, the response to question one is that the placement of students in the Level II fieldwork resulted in a clear benefit to the clinical sites. The sum of the overall mean weekly NPV's for the entire fieldwork period indicated a benefit ranging from $4700 to $4850, depending on the length of the fieldwork experience.

From the covariance form of the regression analysis the following null hypotheses relative to the second basic question were retained:

Controlling for the covariates degree level, number of fieldwork experiences, type of fieldwork, and week of fieldwork, age of student is not a predictor of net present value.

Controlling for the covariates age, number of fieldwork experiences, type of fieldwork and week of fieldwork, there is no difference in the mean net present values between bachelor's-level and master's-level students.

Controlling for the covariates, there is no difference between the adjusted means for physical dysfunction placements and psychiatric placements.

Controlling for the covariates, there is no difference between the adjusted means for physical dysfunction placements and geriatric placements.

Furthermore, the following null hypotheses relative to the second basic question were rejected at the $p < .05$ level.

Controlling for the covariates age, degree level, type of fieldwork, and week of fieldwork, there is no difference in the net present values between the number of fieldwork experiences.

Controlling for the covariates age, degree level, number of fieldwork experiences, and type of fieldwork, there is no curvilinear relationship between week of fieldwork and the NPV.

Controlling for the covariates age, degree level, number of fieldwork experiences, and week of fieldwork, there is no difference in the net present values for students in different types of fieldwork placements.

Controlling for the covariates, there is no significant difference between the adjusted means for physical dysfunction fieldwork placements and pediatric placements.

Said another way, from the statistical analysis it was learned that there was no significant difference in the benefits generated by bachelor's and basic master's-level students, even though the descriptive data indicated a slightly higher benefit for the basic master's-level students. In addition, age apparently had no influence on the resultant net present value during the student fieldwork placement.

The analysis also revealed that type of fieldwork, the number of fieldwork experiences, and week of fieldwork were all directly and significantly related to the dependent variable, the net present value. More specifically, it was found that there was a positive NPV to the clinical site after the third week of the fieldwork placement and that benefits continued to increase in magnitude until the final two to three weeks of the fieldwork placement. A slight decrease in the benefit was noted after the 11th week, which is probably the result of specific activities that occur during the final weeks of fieldwork.

Further, it was determined that the particular type of fieldwork was related to the amount of benefit that was generated. The fieldwork placement in a physical dysfunction setting yielded greater benefits to the institution than that in the pediatric setting. Results from the other two types of fieldwork settings included (psychiatry and geriatrics) showed similar benefits to those of physical dysfunction. Finally, it was learned that the second and third fieldwork experiences of students generated greater benefits for the institution than the first fieldwork experiences.

Conclusions

Based on the questions and hypotheses that gave direction to the study, and the results, the following conclusions may be drawn:

1. A reasonably extended fieldwork experience does not constitute a cost to the institution, rather it is a benefit.

The sixth or seventh week appears pivotal in that at this point the presence of the student becomes a clear financial benefit to

the site, regardless of student related variables. This benefit may accrue slightly earlier in the case of physical dysfunction settings. However, a fieldwork experience of less than five weeks will probably constitute a cost to the fieldwork site in terms of the value of personnel time.

2. There is no relationship between age of student and the value of the benefit of the fieldwork placement.

Again, maturity and possible increased life experiences apparently are no particular advantage in this situation and have no significant effect on the overall net present value.

3. There is no difference in the value of the benefit between bachelor's and basic master's-level students.

The performance of both of these groups in the fieldwork setting is statistically the same. It appears that the additional experiences of basic master's-level students offer no real advantage, perhaps due to the fact that this experience is often unrelated to the practice of occupational therapy. It is important to mention that, while this information may be helpful in evaluating the relative value of bachelor's-level and basic master's-level education, to draw conclusions based on these results alone would be erroneous and should be avoided.

4. There is a positive relationship between the number of fieldwork experiences and the value of the benefit.

That is, students in their first fieldwork experiences had positive mean NPVs. However, students with two or three fieldwork

experiences generated greater NPVs for their facilities than students on their first fieldwork assignments.

5. There is a strong curvilinear relationship between the week of fieldwork and the net present value.

Level II student placement in the fieldwork site generally incurs a cost to the institution for the first two to three weeks, but soon these costs are recovered and a benefit is generated by approximately the sixth week. Benefits continue to increase for the next three to four weeks, then level and decline in magnitude at the conclusion of the fieldwork experience.

6. There are differences among the types of fieldwork settings relative to the value of the benefit of student placement.

Student fieldwork placement in physical dysfunction settings brought about a significantly greater benefit than those in pediatric settings. While no significant difference was found in the NPVs between physical dysfunction and psychiatric placements, it should be noted that the actual p value was .0506, narrowly missing the rejection of the null hypothesis of the comparison of these two types of fieldwork.

Although not directly related to the questions/hypotheses that gave direction to the study, as a result of this investigation it seems appropriate to conclude that, while generally utilized for more global assessments of programs, cost-benefit analysis is also quite useful and appropriate in evaluating programs on a much smaller scale. It appears to be particularly helpful in establishing some

quantifiable measures in a field in which evaluation is usually carried out in more affective, qualitative ways.

Limitations

The external validity of the study was weakened by the nonrandomization of its participants and further by the fact that participation was voluntary. Attrition of subjects was also a threat to external validity in that it raised the possibility of biased responses. However, if one accepts the assumption that occupational therapy programs are similar due to the constraints and requirements placed on them by the national accrediting agency, then with the reasonable rate of return from participants associated with the programs included, it could be argued that the study had a high degree of external validity.

The use of questionnaires and logs that relied on self-reporting methods also introduced further threats to both internal and external validity. Participant misunderstanding of questions asked was a risk, with little opportunity to clarify or check the answers that were given.

A third and major limitation of the study relates to the fact that the cost-benefit analysis was confined to costs based on personnel time. The decision to design the study in this manner was based on the notion, supported by previous research, that the impact of space and overhead costs were nil and the inclusion of factors such as student stipends and payments for room and board in the overall model would introduce error because of their occasional,

rather than across-the-board occurrence. This was further complicated by the anonymous nature of the site questionnaire which was used to obtain supervisor salary information and site treatment charges as well as room, board, and stipend information. As a result, it was not even possible to use the room, board, and salary data in calculating the cost-benefit equation for a specific student/supervisor pair. Rather, this information was collected simply to determine the number of sites in the study that provided these student perquisites and the average dollar value of these factors in order to note possible influence on the average weekly NPVs.

Based on the information from the site questionnaire, it was found that 67 (or 40%) of the 167 sites responding provided room and/or board for students. This amounted to an estimated cost of $36 per week for the sites providing room/board. Only 10 sites (6%) reported paying students a stipend during the fieldwork, costing these sites an average of $75 per week. Finally, an additional 10 sites indicated that they provided both room/board and stipends, valued at an average cost of $58 per week for these 10 sites.

In spite of the exclusion of the above factors from the cost-benefit equation, it is believed that because of the relatively small magnitude of these factors, the overall conclusion of the investigation would remain the same. The practical effect of providing room, board, or stipends would be to delay the time in which a benefit would be realized by the clinical site or to decrease the overall magnitude of the benefit to the clinical site.

A final limitation of the study is that cost-benefit analysis represents but one type of economic analysis. It is limited in that it requires a dollar value assignment to factors identified as costs or benefits. As such, many important qualitative variables escape valuation and are excluded from the cost-benefit equation.

Suggestions for Further Research

Based on the results of the study and the review of the literature, the following suggestions for further research are made.

1. Further research is suggested for the study of additional costs of fieldwork that occur in the form of student stipends and the provision of room, board, and other student assistance measures. Research which would include these factors at the individual institutional level would serve to determine more definitively the effects they may have on the net present value of the fieldwork placement. This could be accomplished through a cost-benefit analysis and comparison of groups that do, and do not, provide these additional student perquisites.

2. Replication of this study would also be useful in determining the consistency of these results over time and with new sets of subjects.

3. A study that would examine more closely the effect of type of fieldwork on the net present value is also indicated. Research in which subjects are more equally distributed in a variety of fieldwork settings would give more conclusive information relative to the impact of this factor.

4. As previously stated, this research failed to show a difference in the benefits between bachelor's-level and basic master's-level students. This is consistent with the occupational therapy professional view that both programs produce entry-level personnel. However, with considerations being made of upgrading professional entry requirements, it is necessary that occupational therapy educational and professional leaders identify what is to be gained, from an institutional and societal point of view, by increasing such requirements. Some justification will need to be made in light of the increased costs associated with master's-level education and the higher salaries that will likely be demanded. Research centering on qualitative differences between bachelor's-level and master's-level personnel may be productive. Further quantitative research in the areas of productivity analysis or a longitudinal comparison of retention rates of these two groups in the profession may also yield useful information. It is important to consider the research reported here as a starting point for further inquiry.

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APPENDIX A
PILOT STUDY

Sample Cover Letter

Route 2, Box 35E12
Archer, FL 32618

March 11, 1985

Elizabeth J. Yerxa, Ed.D., OTR
Chair, Department of Occupational Therapy
University of Southern California
12933 Erickson Avenue
Downey, CA 90242

Dear Dr. Yerxa:

May I have the cooperation of your program for the research study, "The cost/benefit for the entry level bachelor's and master's occupational therapy programs in Level II fieldwork placements"?

In 1983, Eastern Michigan conducted a similar study with their students at the bachelor's level. The results were interesting, and they concluded that a larger study comparing the bachelor's and master's programs should be undertaken by another researcher. Thus the purpose of this study and my requesting your cooperation. As you realize, our profession has a problem developing larger n's in many of their studies, one of the weaknesses of the Eastern Michigan research. It is essential for meaningful results that a number of O.T. schools cooperate in this study.

What is involved? I will work directly with your Fieldwork Supervisor(s). The students in your master's program on fieldwork placement this summer will be asked to keep a simple log for a week at the beginning, middle, and end of a single affiliation. The log will take approximately 10 minutes per day. The supervising clinician will be asked to complete a similar log, under the same arrangement. The completed logs will be returned to me. I will supply the forms for the logs. Essentially, that is it!

If you consider this study worthwhile and feel you can cooperate, will you kindly return the enclosed questionnaire. I will be at the annual conference from April 13th to 19th. Monday, April 15th, appears to be the best day for me to make direct contact with those of you who will be participating.

I would be really pleased if the Level II affiliating students from University of Southern California could participate.

Sincerely,

Linda K. Shalik, ABD, M.Ed., OTR

LKS/lrc

Enclosure

Questionnaire for Bachelor's Level Schools

for RESEARCH: The cost/benefit for the entry level bachelor's and master's occupational therapy programs in Level II fieldwork placements

Name of Participating School: _____

Name of Faculty Contact Person: _____

Title: _____

Phone: Area Code _____ Number _____-_____

Please complete the spaces below to the best of your ability. More complete details will be sent to you before May 1, 1985, relative to the research methodology and protocol.

I. STUDENT INVOLVEMENT

_____ Number of students from your school to be assigned to Level II 1985 summer affiliation.

_____ Number of students to be assigned to other than summer affiliation between June 1 and October 1, 1985.

II. ATLANTA CONFERENCE MEETING

____YES ____NO Will you (or someone from your school) be able to meet with me April 15th at the Atlanta Conference?

____YES I will be able to meet with you _____, during the conference.

____NO I will not be in Atlanta.

III. LEVEL OF INTEREST

____ YES, we will participate in the research.

____ MAYBE, we will have to check with students to get their reaction.

____ MAYBE, we need more information before we can commit.

____ OTHER:

IMPORTANT: KINDLY RETURN BY MARCH 25, 1985, TO: Linda Shalik
Rt. 2, Box 35E12
Archer, FL 32618

Questionnaire for Master's Level Schools

for RESEARCH: The cost/benefit for the entry level bachelor's and master's occupational therapy programs in Level II fieldwork placements

Name of Participating School: _____

Name of Faculty Contact Person: _____

Title: _____

Phone: Area Code _____ Number ____-_____

Please complete the spaces below to the best of your ability. More complete details will be sent to you before May 1, 1985, relative to the research methodology and protocol.

I. STUDENT INVOLVEMENT

_____ Number of students from your school to be assigned to Level II 1985 summer affiliation.

_____ Number of students to be assigned to other than summer affiliation between June 1 and October 1, 1985.

II. ATLANTA CONFERENCE MEETING

____YES ____NO Will you (or someone from your school) be able to meet with me April 15th at the Atlanta Conference?

____YES I will be able to meet with you _____, during the conference.

____NO I will not be in Atlanta.

III. LEVEL OF INTEREST

____ YES, we will participate in the research.

____ MAYBE, we will have to check with students to get their reaction.

____ MAYBE, we need more information before we can commit.

____ OTHER:

IMPORTANT: KINDLY RETURN BY MARCH 25, 1985, TO: Linda Shalik
Rt. 2, Box 35E12
Archer, FL 32618

APPENDIX B
SAMPLE INTRODUCTORY LETTERS

Center for Health Sciences
University of Wisconsin-Madison
SCHOOL OF ALLIED HEALTH PROFESSIONS

Occupational Therapy Program
2110 Medical Sciences Center
1300 University Avenue
Madison, Wisconsin 53706
(608) 262-2936

Dear Affiliating O.T. Student:

The occupational therapy program at the University of Wisconsin-Madison is joining in a national study on cost/benefit analysis of Level II fieldwork in O.T. education. This is an important study in that it will determine, in a definitive manner, whether the placement of O.T. fieldwork students in clinical settings incurs an overall financial cost or benefit to that setting. This piece of information is essential in defending continued free clinical education to our students in the face of hospital budget tightening brought about by prospective payment systems.

In order to support this study we are encouraging your involvement (along with your direct supervisor's involvement) in keeping a brief log, requiring up to 10 minutes daily, for three, one-week periods during this summer's affiliation. Efforts have been made to keep your time investment low, and to protect confidentiality through the use of a coding system.

Included in this letter is a sample copy of the time log, with instructions for its completion, for you to look over. You will be receiving three of these logs during your affiliation, dated according to the weeks they are to be completed.

We are certain that you will realize the value of this study and its implications for O.T. education. In order to have meaningful results, it is important to have wide participation throughout our student population. Your participation is appreciated, and highly valued.

Sincerely,

Janet E. Decker, OTR
O.T. Program

Linda Shalik, OTR/L
Researcher

Center for Health Sciences
University of Wisconsin-Madison
SCHOOL OF ALLIED HEALTH PROFESSIONS

Occupational Therapy Program
2110 Medical Sciences Center
1300 University Avenue
Madison, Wisconsin 53706
(608) 262-2936

Dear Colleague:

As hospitals and other health providers continue to experience the pressures of cost containment, they have begun to study (and question) the underwriting of allied health fieldwork education, including occupational therapy. Some feel that these programs are costly to the institution. Others believe that while students do incur supervision costs, their added manpower in the treatment process brings about a net benefit to the institution.

In order to more definitively answer this question of costs and benefits in O.T. student fieldwork, we are enlisting your support and participation in a study coordinated by Linda Shalik, OTR, from the University of Florida, Division of Higher Education Administration. This study expands on a 1979 study by Lyla Spelbring, Ph.D., OTR, in which the clinical supervisor and the student filled out time logs. We are requesting a similar effort by you and your affiliating student. Our log requires no more than ten minutes per day and is kept for three, 5-day periods, spaced over the student's affiliation. It should take very little of your time.

Enclosed is the clinical supervisor's sample log and instructions. During the affiliation, you will receive a total of three sets of similar log sheets to fill out during specified times. Log sheets will be coded to maintain the confidentiality of all concerned.

The research design is to collect nationwide fieldwork logs from students and therapists involved in occupational therapy programs similar to yours. The results will be shared with you. The entire study will be published as a dissertation.

In order to have meaningful results, this study requires wide representation. Your participation is extremely important. The University of Wisconsin-Madison, O.T. curriculum endorses this study and urges and welcomes your cooperation.

Sincerely,

Janet E. Decker, OTR
Occupational Therapy Program

Linda Shalik, OTR
Researcher

APPENDIX C
TIME LOGS AND INSTRUCTIONS

Instructions for Student Time Log

The purpose of this log sheet is to determine the amount of time you spend daily in independent patient treatment, joint patient treatment (with other OT students or therapists), participation in meetings, administrative work, and clerical duties.

Fill out the student log sheet for three, one-week periods spaced throughout your fieldwork assignment. Each log sheet is dated, according to the week it is to be completed. Make entries at the close of each day during the week.

Fill out the log categories as follows:

I. PATIENT TREATMENT:

A. Independent - The amount of time you spend daily treating patients without supervision from others. Enter the total time spent for the whole day, rounding to the nearest 15 minutes.

B. Joint - The time spent working with other students, or therapists, in patient treatment. Record the time spent in each treatment session; the number of patients involved, the number of therapists directly involved; and the number of students involved (counting yourself as 1).
EXAMPLE: Three patients come to the treatment area for 30 minutes of group treatment which you and a fellow student carry out without supervision. You would document as follows:

SESSION #	1	2	3	4
Length of session: (in minutes)	30			
No. of patients:	3			
No. of therapists:	0			
No. of students: (include yourself)	2			

Note: If you are involved in more than four joint treatment sessions per day, additional spaces are provided on the back of the data sheet.

II. ADMINISTRATIVE WORK: Enter the amount of time spent doing paperwork, documentation, planning, etc. similar to those tasks normally carried out by a staff therapist. Do not include those tasks that can be classified as purely student assignments, e.g., writing a case study.

III. MEETINGS: The amount of time spent in meetings in which you participated as would a regular therapist, such as reporting on a patient at the interdisciplinary team meeting. This would not include attendance for observational or purely educational purposes.

IV. CLERICAL OR AIDE DUTIES: Record time spent in clinic cleanup, typing, filing, etc.

Refer questions to: Linda Shalik, MEd, OTR, Researcher
Rt. 2, Box 35E12
Archer, FL 32618

Please return log sheets within 5 working days of completion to the above address.

Please read instruction sheet before completing!

STUDENT TIME LOG

Student Code: _____ Log Sheet # _____

Age: _____ Sex: _____ Fieldwork Experience #1 #2 #3 (circle)

Note: Round all time entries to nearest 15 minutes.

Type of Fieldwork: phys. dys.____ peds.____ psych.____ geriatric____

		MONDAY				TUESDAY				WEDNESDAY				THURSDAY				FRIDAY			
I. PATIENT TREATMENT: A. Independent--no supervision received. Enter total time spent.		___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.			
B. Joint--worked with other students or therapists to treat patients. Enter data for each joint treatment session. (Additional space on back.)	SESSION #	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Length of session (in minutes):																				
	No. of patients:																				
	No. of therapists:																				
	No. of students (include yourself):																				
II. ADMINISTRATIVE WORK: Progress notes, evaluation write-ups, planning for patient treatment. Enter total time spent.		___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.			
III. MEETINGS: Time spent in participation, not observation, e.g., presenting a client's program at team meeting.		___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.			
IV. CLERICAL OR AIDE DUTIES: Time spent in cleanup, typing, filing, or similar duties.		___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.				___hrs.___min.			

Return to: Linda Shalik, MEd, OTR, Researcher
Rt. 2, Box 35E12
Archer, FL 32618

Return by: _____

Instructions for Fieldwork Supervisor's Time Log

The purpose of the log sheet is to record the amount of time you (or other facility staff) spend daily in the supervision of your Level II fieldwork student. Supervision may be classroom instruction, patient treatment, or observation. It may occur indirectly through preparation, coordination, and documentation associated with the clinical education program.

Please fill out the log sheet for three, one-week designated periods during the fieldwork period. The log sheets will be dated according to the weeks they are to be filled out. Daily entries are requested.

Complete the log categories as follows:

Please complete the blanks at the top of the form. Coded information will be on each log to pair supervisor and student data sheets, and to separate bachelor's from basic master's level students. Once the logs are collected, the master list of participant names will be destroyed to assure confidentiality.

I. GENERAL SUPERVISION OF STUDENT: The total time you spend each day individually with your student (e.g., individual instruction, directions, and feedback).

II. MEETINGS: The time you spend in meetings in which your attendance is necessary to enhance the student's learning experience. EXAMPLE: If you attend a 30-minute meeting in which you supervise your student's presentation for 15 minutes, and make a presentation of your own for 15 minutes, count only 15 minutes of the student presentation toward your log entry.

III. PREPARATION/ADMINISTRATION: Include time spent each day in planning and preparation of the clinical fieldwork experience, including time spent in grading and documentation.

IV. TEACHING SESSIONS: Refers to instruction given in a classroom or similar group session by OTRs or other professionals. For each such session, give (1) number of students in attendance; (2) length of session; (3) time given in instruction by OTs, PTs, M.D.s and others. If a team presentation is given, record the time each professional spent, not a single total. EXAMPLE: A 60 minute orientation session for five OT students is given in which two OTRs spent 30 minutes each discussing procedures, and two RPTs give 10 and 20 minute lectures respectively. Record this session as indicated on reverse side.

SESSION #	1	2	3	4
No. of students present	5			
Length of session (in Min.)	60			
Instruction by: OTR's (total min.)	60			
RPTs	30			
M.D.s				
RNs				
Others (Specify)				

Note: 2 OTRs X 30 min. = 60 min.

10 min. + 20 min. = 30 min.

IMPORTANT:

1. This study assumes that one therapist supervises one student. If you supervise more than one student concurrently, please keep data on only one student, and have that same student keep the daily student log. Designate the student who will keep the log.

2. Occasionally a student has different supervisors during a single affiliation. The therapist providing direct supervision during the week the log sheet is to be completed should make the entries.

REFER ALL QUESTIONS TO:

Linda Shalik, MEd, OTR, Researcher
Rt. 2, Box 35E12
Archer, FL 32618 Phone (904) 495-2908

Please return log sheets within 5 working days of completion to the above address.

Please read instruction sheet before completing!

FIELDWORK SUPERVISOR'S TIME LOG

Supervisor's Code: _____ Note: Round all time entries to nearest 15 minutes. Date of Data Collection: _____

Sex: M F Log Sheet # _____ Week of Fieldwork: _____

		MONDAY				TUESDAY				WEDNESDAY				THURSDAY				FRIDAY			
I. GENERAL SUPERVISION OF STUDENT: Total time spent by OTR in direct supervision of student, one-on-one. (Do not include formal teaching sessions.)		___hrs. ___min.				___hrs. ___min.				___hrs. ___min.				___hrs. ___min.				___hrs. ___min.			
II. MEETINGS: Time spent attending meetings for the sole purpose of observing or supervising the student.		___hrs. ___min.				___hrs. ___min.				___hrs. ___min.				___hrs. ___min.				___hrs. ___min.			
III. PREPARATION/ADMINISTRATION: Time spent to prepare for, or coordinate student training program (e.g., planning, documentation, FWPR, etc.)		___hrs. ___min.				___hrs. ___min.				___hrs. ___min.				___hrs. ___min.				___hrs. ___min.			
IV. TEACHING SESSIONS: (orientation, classes, etc.) 1. List total time spent per session by each category of professional (e.g., if 2 OTRs spent 15 and 30 min., respectively, enter sum 45 min. next to OTR, etc.) 2. Note: one-to-one supervision of students by other professional(s) should also be calculated in this section.	SESSION #	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	No. of students present																				
	Length of session (in min.)																				
	Instruction by: OTRs (total min.)																				
	RPTs																				
	M.D.s																				
	RNs																				
	Others (specify)																				

APPENDIX D
SITE QUESTIONNAIRE

Cost-Benefit Questionnaire

The following information is requested for completion of the cost-benefit analysis study. Please circle the correct answer and fill in the appropriate blanks.

Reimbursement for students:

Are students given a salary or stipend? Y N

If yes, indicate dollar amount per hour (or appropriate unit of time): _____

Are students offered free or discounted room or board? Y N

Give approximate value of this benefit.

Average cost per day to the facility for meals: _____

Average cost per month to the facility for room: _____

Are students given other benefits not indicated above? Please list and give dollar value on reverse side. Y N

Value of therapist's time:

Indicate average yearly salary for student supervisor(s) in your facility. _____

Value of treatment time:

Indicate average per unit charge for O.T. services in your facility. (Give dollar amount, and amount of time in one treatment unit. For example, $15 charge for 15 minute treatment session. _____

If different method of charging is used, please describe:

APPENDIX E
FINAL COVER LETTERS

Rt. 2, Box 35E12
Archer, FL 32618

July 13, 1985

Dear Colleague:

Thank you for participating in the cost-benefit analysis of Level II fieldwork placement. The support of this research by you and your student has been most gratifying, and will help make the results much more meaningful to members of our profession. I look forward to sharing the results through the American Occupational Therapy Association National Conference and/or publication early next year.

Enclosed you will find the final student/supervisor log sheets. As you will recall, the blue sheet is for the supervisor's information and the white sheet is for the student to complete.

In addition, there is a one page questionnaire which you are requested to complete. This provides essential information relative to additional costs that may occur as a result of student placement and will also allow me to determine an average dollar value to a supervisor's time, in terms of both salary and treatment revenue. All information given on this questionnaire is completely confidential.

Again, your assistance in the data collection of this research is most appreciated.

Sincerely,

Linda Shalik, M.Ed., O.T.R.

Route 2, Box 35E12
Archer, FL 32618

July 9, 1985

Dear Colleague:

Enclosed you will find the final student/supervisor log sheets to the cost-benefit study of Level II fieldwork placement. Your participation in this last data collection period will be most appreciated. Although you were unable to participate in the study prior to this point, your input is even more critical now so that research errors as a result of response bias can be avoided. However, if you will not be participating in the study, please notify me of this decision.

Along with the final data sheets, you will find a one page questionnaire that is used to obtain information relative to additional costs that may occur as a result of student placement. In addition, it will also permit me to assign an average dollar value to a student supervisor's time, in terms of both salary and treatment revenue. All information given on this questionnaire is strictly confidential and will not be identified in any way with you or your facility.

The response nationwide to this research has been quite positive and I believe you will find the knowledge gained very valuable to our profession. I look forward to receiving this important information from you and your student.

Sincerely,

Linda Shalik, M.Ed., O.T.R.

APPENDIX F
COMPUTER COMMANDS FOR DATA ANALYSIS

Data Format

```
DATA;
INPUT CASE 1-3 AGE 5-6 DEGREE 8 FWEXP 10 WEEK 12-13 TYPEFW 15 NO
17 NPV 19-23; WEEK2=WEEK**2;
IF TYPEFW=2 THEN X5=1;ELSE X5=0;
IF TYPEFW=3 THEN X6=1;ELSE X6=0;
IF TYPEFW=4 THEN X7=1;ELSE X7=0;
IF TYPEFW=1 AND DEGREE=0 THEN ID=A;
IF TYPEFW=2 AND DEGREE=0 THEN ID=B;
IF TYPEFW=3 AND DEGREE=0 THEN ID=C;
IF TYPEFW=4 AND DEGREE=0 THEN ID=D;
IF TYPEFW=1 AND DEGREE=1 THEN ID=E;
IF TYPEFW=2 AND DEGREE=1 THEN ID=F;
IF TYPEFW=3 AND DEGREE=1 THEN ID=G;
IF TYPEFW=4 AND DEGREE=1 THEN ID=H;
CARDS;
```

Descriptive Statistics

```
PROC MEANS; VAR NPV;
PROC SORT; BY DEGREE;
PROC MEANS; VAR NPV; BY DEGREE;
PROC SORT; BY FWEXP;
PROC MEANS; VAR NPV; BY FWEXP;
PROC SORT; BY WEEK;
PROC MEANS; VAR NPV; BY WEEK;
PROC SORT; BY TYPEFW;
PROC MEANS; VAR NPV; BY TYPEFW;
```

Multiple Regression: Full Model and Reduced Model

```
PROC REG;
MODEL NPV=AGE DEGREE FWEXP WEEK WEEK2 X5 X6 X7;
OUTPUT OUT=NEW P=YHAT R=EHAT;
PROC REG;
MODEL NPV=AGE DEGREE FWEXP WEEK WEEK2;
```

Scatterplots for Testing Assumptions

Test for Outliers, Homoscedasticity, Normality

```
PROC PLOT;
PLOT EHAT*YHAT;
```

Test for Noninteraction

```
PROC SORT; BY ID;
PLOT EHAT*AGE; BY ID;
PLOT EHAT*FWEXP; BY ID;
PLOT EHAT*WEEK; BY ID;
```

Test for Linearity

```
PROC PLOT;
PLOT EHAT*(WEEK FWEXP AGE DEGREE X5 X6 X7);
```

SAS Program for Figure 1

```
DATA;
DO W=1 TO 13;
YHAT=-859.106+2.784867*22-74.416840+194.638+290.885*W
   -15.204495*W**2;
```

APPENDIX G
DATA FOR WEEKLY NET PRESENT VALUE (BENEFIT-COST)

Legend

SUB - Subject pair
PI - Individual patient treatment
PJ - Joint or group patient treatment
M - Meetings
D - Clerical or aide duties
A - Administrative work
G - General one-to-one supervision
P - Preparation and administration
I - Formal instructional sessions
NPV - Net present value

Bachelor's-Level Participants (n=130)

	STUDENT (BENEFIT)						SUPERVISOR (COST)					DIFFERENCE
SUB	PI +	PJ +	M +	D +	A =	BENEFIT	G +	M +	A +	I =	COST	NPV
001	552.15	182.21	54.06	0.00	119.48	907.90	1242.34	122.70	153.38	24.54	1542.96	- 635
002	1349.70	30.68	22.76	0.00	102.42	1505.56	153.38	230.06	260.74	0.00	644.18	+ 861
003	214.73	853.99	22.76	3.35	73.97	1168.80	92.03	0.00	76.69	0.00	168.71	+1000
004	935.59	138.04	34.14	12.56	65.43	1185.76	76.69	0.00	122.70	0.00	199.39	+ 986
005	0.00	290.19	82.51	8.38	133.70	514.78	920.25	30.68	414.11	125.77	1490.81	- 976
006	552.15	1042.95	22.76	3.35	116.65	1737.86	552.15	122.70	122.70	460.13	1257.68	+ 480
007	92.03	613.50	11.38	0.00	236.13	953.04	122.70	61.35	61.35	0.00	245.40	+ 780
008	0.00	299.39	11.38	1.68	22.75	335.20	260.74	30.68	30.68	92.03	414.11	- 79
009	1533.75	322.09	0.00	0.00	34.14	1889.98	153.38	0.00	368.10	61.35	582.83	+1307
010	1257.67	71.78	11.38	2.51	96.74	1440.08	61.35	30.68	61.35	61.35	214.73	+1225
011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.69	590.80	667.49	- 667
012	966.26	0.00	11.38	4.19	142.25	1124.08	76.69	15.34	61.35	30.67	184.05	+ 940

013	460.13	92.03	14.23	0.00	54.04	620.43	92.03	291.41	76.69	0.00	460.13	+ 160
014	0.00	0.00	0.00	20.10	22.76	42.86	337.43	0.00	184.05	460.12	981.60	- 939*
015	644.18	56.44	5.69	4.19	136.55	847.05	61.35	122.70	138.04	168.71	490.80	+ 356
016	1349.70	92.03	28.45	14.24	105.26	1589.68	368.10	0.00	184.05	0.00	552.15	+1038
017	245.40	682.83	45.52	11.72	42.68	1028.15	1533.75	0.00	0.00	0.00	1533.75	- 506
018	736.20	61.35	11.38	6.70	79.66	895.29	138.04	0.00	107.36	0.00	245.40	+ 650
019	383.44	475.46	34.14	3.35	147.94	1044.33	168.71	122.70	184.05	874.24	1349.70	- 305
020	981.60	84.66	34.14	10.05	96.73	1207.18	506.14	153.38	153.38	15.34	828.23	+ 379
021	0.00	1165.65	108.11	16.75	62.59	1353.10	490.80	521.48	153.38	182.82	1348.47	+ 5
022	598.16	322.09	59.75	6.70	73.97	1060.67	214.73	122.70	46.01	15.34	398.78	+ 662
023	260.74	153.38	0.00	7.54	273.11	694.77	429.45	0.00	460.13	352.76	1242.34	- 548
024	107.36	429.45	108.11	18.43	56.90	720.25	199.39	153.38	429.45	2822.10	3604.31	-2884**
025	306.75	490.80	85.35	16.75	153.63	1053.28	306.75	122.70	368.10	0.00	797.55	+ 256
026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	260.74	260.74	- 261
027	858.90	230.06	17.07	4.19	82.51	1192.73	122.70	15.34	122.70	0.00	260.74	+ 932
028	444.79	444.79	14.23	5.03	42.66	951.50	61.35	138.04	15.34	0.00	214.73	+ 737
029	0.00	889.58	0.00	5.03	62.58	957.19	153.38	61.35	30.68	0.00	245.40	+ 712
030	398.78	184.05	62.59	5.86	184.92	836.20	61.35	0.00	30.68	0.00	92.03	+ 744
031	245.40	322.09	170.70	0.00	159.32	897.51	92.03	61.35	30.68	30.68	214.73	+ 683

032	0.00	460.13	2.85	10.05	5.68	478.71	214.73	92.03	61.35	168.71	536.81	- 58
033	1104.30	353.99	58.95	1.24	119.72	1638.20	245.40	61.35	61.35	0.00	368.10	+1270
034	736.20	115.03	2.85	4.19	122.33	980.60	306.75	0.00	46.01	153.38	506.14	+ 474
035	0.00	705.52	22.76	5.03	25.61	758.92	414.11	0.00	76.69	766.88	1257.68	- 499
036	1663.80	0.00	16.61	4.12	33.58	1718.12	306.75	153.38	0.00	102.45	562.58	+1156
037	1349.70	15.34	22.76	1.68	45.51	1434.99	76.69	30.68	199.39	0.00	306.75	+1128
038	61.35	555.22	5.69	6.70	5.69	634.65	168.71	0.00	61.35	15.34	245.40	+ 389
039	950.93	0.00	5.69	0.00	108.11	1064.73	184.05	15.34	30.68	736.20	966.26	+ 98
040	1134.98	61.35	36.99	0.00	45.51	1278.83	61.35	276.07	168.71	168.71	674.85	+ 604*
041	368.10	199.39	68.28	4.19	113.70	753.76	230.06	61.35	184.05	0.00	475.46	+ 278
042	15.34	291.41	73.97	0.00	39.83	420.55	398.78	230.06	107.36	100.00	836.20	- 416
043	1840.50	0.00	31.30	2.51	45.52	1919.83	92.03	92.03	76.69	12.27	273.01	+1647
044	582.83	797.55	79.66	0.00	119.49	1579.53	230.06	61.35	61.35	127.61	480.37	+1099
045	423.32	844.79	17.07	18.29	56.44	1359.91	383.44	276.07	245.40	115.34	1020.25	+ 340
046	920.25	245.40	62.59	6.70	113.80	1348.74	107.36	30.68	122.70	84.66	345.40	+1003
047	1411.05	0.00	11.38	8.38	153.63	1584.44	1058.29	107.36	138.04	122.70	1426.39	+ 158
048	92.03	644.18	39.83	2.51	85.34	863.89	214.73	46.01	107.36	0.00	368.10	+ 496
049	644.18	276.07	68.28	0.00	79.66	1068.19	245.40	122.70	76.69	306.75	751.54	+ 317
050	552.15	514.11	5.69	4.19	136.56	1212.70	736.20	61.35	214.73	306.75	1319.03	- 106
051	0.00	1042.95	22.76	0.00	68.28	1133.99	199.39	122.70	153.38	0.00	475.46	+ 659

052	522.15	633.13	27.20	10.08	119.61	1342.17	168.71	15.34	0.00	61.35	245.40	+1097
053	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	560.13	560.13	- 560
054	92.03	506.14	82.51	4.19	51.20	736.07	460.13	260.74	76.69	184.05	981.60	- 246
055	414.11	360.74	0.00	0.00	56.90	831.75	981.60	0.00	153.38	20.25	1155.22	- 323
056	0.00	1012.28	0.00	0.00	102.41	1114.69	674.85	61.35	214.73	0.00	950.92	+ 164
057	1441.73	0.00	25.61	0.00	147.93	1615.27	322.09	92.03	107.36	0.00	521.48	+1094
058	506.14	30.68	25.61	4.19	28.44	595.06	0.00	0.00	138.04	0.00	138.04	+ 457
059	122.70	843.56	0.00	0.00	2.85	969.11	306.75	61.35	153.38	153.38	674.85	+ 294
060	674.85	0.00	130.87	15.91	48.37	870.00	260.74	245.40	107.36	20.25	633.75	+ 236
061	705.52	84.66	11.38	0.84	142.26	944.66	490.80	0.00	153.38	0.00	644.18	+ 300
062	1247.86	91.41	51.21	3.35	34.14	1427.97	76.69	214.73	92.03	30.68	414.11	+1014
063	352.76	368.10	8.54	5.86	88.20	823.46	153.38	0.00	0.00	0.00	153.38	+ 670
064	736.20	209.20	22.76	0.84	102.42	1071.42	276.07	122.70	245.40	30.68	674.85	+ 397
065	46.01	812.89	65.44	4.19	59.74	988.27	214.73	0.00	15.34	337.43	567.49	+ 421
066	628.84	161.35	51.21	5.86	91.04	938.30	291.41	245.40	245.40	0.00	782.21	+ 156
067	0.00	944.79	0.00	8.37	0.00	953.16	1227.00	0.00	92.03	429.45	1748.48	- 795
068	874.24	100.00	19.92	0.00	45.51	1039.67	613.50	0.00	153.38	30.68	797.55	+ 242
069	368.10	199.39	62.59	5.03	34.13	669.24	76.69	138.04	61.35	100.00	376.08	+ 293*
070	0.00	61.35	0.00	0.84	0.00	62.19	92.03	0.00	184.05	771.78	1047.86	- 986

071	1104.30	168.71	17.07	4.19	150.79	1445.06	230.06	122.70	0.00	0.00	352.76	+1092
072	398.78	0.00	11.38	3.35	193.46	606.97	76.69	168.71	76.69	0.00	322.09	+ 285
073	92.03	315.34	28.45	1.68	22.75	460.25	383.44	0.00	245.40	460.13	1088.96	- 629
074	950.93	82.21	68.28	6.70	147.93	1256.05	199.39	30.68	15.34	122.70	368.10	+ 888
075	613.50	122.70	17.07	0.00	39.80	793.10	306.75	153.38	153.38	0.00	613.50	+ 180
076	107.36	352.76	34.14	4.19	34.14	532.59	46.01	0.00	138.04	0.00	184.05	+ 349
077	1257.67	460.13	31.30	7.54	79.65	1836.29	199.39	46.01	245.40	429.45	920.25	+ 916
078	1533.75	214.73	14.23	1.68	28.44	1792.83	337.43	0.00	0.00	23.31	360.74	+1432
079	76.69	368.10	36.99	0.00	17.06	498.84	214.73	46.01	107.36	768.10	1136.20	- 637
080	214.73	460.13	11.38	0.00	97.72	782.96	61.35	138.04	15.34	0.00	214.73	+ 568
081	1012.28	260.74	65.44	4.19	76.80	1419.45	245.40	168.71	214.73	15.34	644.18	+ 775
082	736.20	122.70	28.45	8.38	39.83	935.56	782.21	92.03	536.81	0.00	1411.05	- 475
083	61.35	705.52	108.11	11.72	105.27	991.97	245.40	30.68	184.05	0.00	460.13	+ 532
084	797.55	0.00	91.04	0.84	62.59	952.02	76.69	61.35	383.44	276.07	797.55	+ 154
085	736.20	0.00	17.07	10.05	91.04	854.36	0.00	0.00	107.36	0.00	107.36	+ 747
086	92.03	954.61	34.14	7.47	68.27	1156.52	429.45	184.05	184.05	1058.29	1855.84	- 699
087	874.24	138.04	19.92	0.00	147.93	1180.13	398.78	92.03	153.38	6.14	705.52	+ 475
088	1165.65	0.00	8.54	0.84	48.36	1223.39	0.00	61.35	0.00	0.00	61.35	+1162
089	981.60	0.00	5.69	0.00	56.90	1044.19	122.70	30.68	184.05	69.33	406.75	+ 637
090	490.80	352.76	99.58	2.51	153.63	1099.28	230.06	92.03	92.03	0.00	414.11	+ 685

091	322.09	1242.34	56.90	5.03	56.89	1683.25	76.69	92.03	15.34	322.09	506.14	+1177
092	1625.77	122.70	28.45	4.19	68.28	1849.39	306.75	214.73	245.40	0.00	766.88	+1083
093	0.00	1380.38	11.38	0.00	0.00	1391.76	230.06	0.00	138.04	1380.38	1748.48	- 357
094	1819.64	54.60	28.45	3.35	58.38	1964.42	30.68	0.00	0.00	0.00	30.68	+1934
095	429.45	199.39	31.30	0.84	170.69	831.67	1288.35	30.68	582.83	342.33	2244.18	-1413
096	76.69	567.49	110.96	1.68	71.11	827.93	398.78	214.73	153.38	161.96	928.84	- 101
097	444.79	377.30	19.92	12.56	71.12	925.69	536.81	61.35	61.35	0.00	659.51	+ 266
098	1027.61	138.65	25.61	17.59	65.43	1274.89	552.15	61.35	15.34	168.71	797.55	+ 477
099	122.70	1042.95	62.59	25.13	39.82	1293.19	30.68	245.40	46.01	61.35	383.44	+ 910
100	1104.30	41.10	22.76	0.00	85.35	1253.51	0.00	15.34	168.71	0.00	184.05	+1069
101	245.40	521.48	73.97	10.05	119.49	970.39	184.05	122.70	61.35	61.35	429.45	+ 541
102	368.10	919.64	42.68	14.24	62.58	1407.24	61.35	306.75	46.01	0.00	414.11	+ 993
103	122.70	567.49	51.21	0.00	56.90	798.30	153.38	0.00	46.01	0.00	199.39	+ 599
104	0.00	981.60	0.00	0.00	51.21	1032.81	1242.34	153.38	199.39	122.70	1717.80	- 685
105	1073.63	0.00	0.00	4.19	28.44	1106.26	260.74	107.36	61.35	429.45	858.90	+ 247
106	1564.42	291.41	17.07	7.54	68.28	1948.72	230.06	30.68	30.68	92.03	383.44	+1565*
107	521.48	613.50	71.13	8.37	0.00	1214.48	690.19	0.00	184.05	0.00	874.24	+ 340
108	736.20	0.00	5.69	3.35	17.06	762.31	276.07	0.00	30.68	276.07	582.82	+ 179
109	0.00	514.11	48.37	0.00	42.67	605.15	230.06	0.00	46.01	38.65	314.73	+ 290

110	828.23	30.68	14.23	4.19	48.35	925.68	398.78	46.01	199.39	0.00	644.18	+ 282
111	368.10	92.03	108.11	30.15	79.66	678.05	245.40	61.35	76.69	166.26	549.70	+ 128
112	1073.63	261.35	25.61	4.19	51.20	1415.98	276.07	138.04	153.38	0.00	567.49	+ 848
113	352.76	76.69	0.00	2.51	62.59	494.55	76.69	0.00	30.68	0.00	107.36	+ 387
114	276.07	306.75	91.04	8.38	110.96	793.20	306.75	383.44	168.75	496.94	1355.84	- 563
115	214.73	506.14	59.75	5.03	17.05	802.70	690.19	61.35	184.05	155.83	1091.42	- 289
116	613.50	230.06	25.61	2.51	71.13	942.81	521.48	0.00	122.70	0.00	644.18	+ 299
117	1165.65	153.38	11.38	0.00	170.70	1501.11	644.18	0.00	0.00	92.03	736.20	+ 765
118	904.91	0.00	48.37	6.70	130.87	1090.85	153.38	0.00	46.01	0.00	199.39	+ 891
119	490.80	168.71	19.92	8.38	36.98	724.79	996.94	46.01	153.38	122.70	1319.02	- 594
120	107.36	552.15	93.89	4.19	39.83	797.42	260.74	76.69	352.76	46.63	736.81	+ 61
121	383.44	552.15	0.00	8.38	51.20	995.17	61.35	122.70	61.35	0.00	245.40	+ 750
122	61.35	828.23	19.92	0.84	130.86	1041.20	122.70	0.00	138.04	0.00	260.74	+ 780
123	184.05	1227.00	45.52	3.35	22.76	1482.68	306.75	0.00	15.34	1227.00	1549.09	- 66
124	843.56	299.39	19.92	0.84	142.24	1305.95	92.03	92.03	0.00	184.05	368.10	+ 938
125	92.03	552.15	79.66	0.00	91.04	814.88	521.48	184.05	230.06	0.00	935.59	- 121
126	2085.90	0.00	8.54	0.00	51.20	2145.64	0.00	0.00	76.69	0.00	76.69	+2069
127	490.80	460.13	48.37	9.21	62.58	1071.09	736.02	30.68	138.04	199.39	1104.30	- 33
128	0.00	582.83	68.28	5.03	207.68	863.82	368.10	368.10	245.40	92.03	1073.63	- 210
129	506.14	1104.30	25.61	8.38	56.89	1701.32	306.75	61.35	122.70	153.38	644.18	+1057
130	1273.01	23.01	39.83	6.70	96.73	1439.28	168.71	15.34	46.01	0.00	230.06	+1209

Master's-Level Participants (n=51)

131	30.68	260.74	11.38	0.00	113.79	416.59	168.71	61.35	245.40	84.66	560.13	- 144
132	1441.73	15.34	28.45	11.72	76.81	1574.05	76.69	61.35	30.68	30.68	199.39	+1375
133	1809.83	15.34	11.38	4.19	68.27	1909.01	138.04	30.68	61.35	0.00	230.06	+1679
134	46.01	981.60	62.59	10.89	102.42	1203.51	122.70	1196.33	138.04	46.01	1503.07	- 300
135	1380.38	15.34	28.45	10.05	96.72	1530.94	122.70	0.00	214.73	76.69	414.11	+1117
136	368.10	705.52	91.04	8.38	108.11	1281.15	107.36	306.75	92.03	53.99	560.13	+ 721
137	644.18	398.78	91.04	6.70	139.40	1280.10	107.36	0.00	61.35	0.00	168.71	+1111
138	828.23	230.06	34.14	5.03	45.51	1142.97	214.73	61.35	153.38	0.00	429.45	+ 714
139	460.13	92.03	17.07	4.19	91.03	664.45	490.80	306.75	352.76	207.36	1357.68	- 693
140	981.60	53.99	19.92	4.19	71.12	1130.82	276.07	61.35	122.70	0.00	460.13	+ 671
141	536.81	0.00	28.45	0.00	0.00	565.26	230.06	0.00	92.03	61.35	383.44	+ 182
142	1579.76	38.96	14.23	4.19	65.43	1702.57	705.52	92.03	184.05	76.69	1058.29	+ 644
143	398.78	61.35	0.00	0.84	19.91	480.88	306.75	122.70	92.03	46.01	567.49	- 87
144	690.19	0.00	14.23	0.00	119.48	823.90	0.00	0.00	291.41	0.00	291.41	+ 532
145	785.28	1009.82	9.56	6.57	89.78	1901.01	76.69	15.34	168.71	146.01	406.75	+1494
146	644.18	613.50	0.00	6.70	34.14	1298.52	674.85	46.01	184.05	383.44	1288.35	+ 10
147	1319.03	30.68	11.38	9.21	96.72	1467.02	107.36	76.69	30.68	30.68	245.40	+1222

148	429.45	230.06	19.92	0.84	125.18	805.45	276.07	15.34	245.40	0.00	536.81	+ 269*
149	168.71	1165.65	73.97	12.56	45.53	1466.42	981.60	153.38	122.70	164.42	1422.09	+ 44
150	990.19	527.00	20.71	23.99	36.98	1598.87	245.40	76.69	92.03	0.00	414.11	+1185*
151	790.19	0.00	82.51	10.89	147.93	1031.52	122.70	122.70	0.00	0.00	245.40	+ 786
152	46.01	1144.79	22.76	0.84	0.00	1214.40	613.50	0.00	153.38	950.93	1717.80	- 503
153	659.51	161.96	45.52	1.68	73.97	942.64	230.06	245.40	92.03	122.70	690.19	+ 252
154	828.23	30.68	22.76	0.00	119.48	1001.15	184.05	15.34	337.43	0.00	536.81	+ 464
155	368.10	460.13	85.35	0.00	68.28	981.86	184.05	214.73	0.00	46.01	444.79	+ 537
156	61.35	628.84	56.90	6.70	85.35	839.14	245.40	0.00	122.70	88.34	456.44	+ 383
157	337.43	843.56	45.52	0.00	39.83	1266.34	184.05	168.71	76.69	107.36	536.81	+ 730
158	1134.98	153.38	59.75	7.54	73.95	1429.60	306.75	214.73	0.00	0.00	521.48	+ 908
159	0.00	552.15	0.00	4.19	85.35	641.69	1104.30	0.00	30.68	0.00	1134.98	- 493
160	1380.38	0.00	108.11	0.00	68.28	1556.77	0.00	153.38	0.00	122.70	276.08	+1281
161	306.75	276.07	17.07	28.48	194.84	833.21	153.38	184.05	92.03	460.12	889.58	- 56
162	0.00	398.78	39.83	3.35	56.90	498.86	414.11	0.00	199.39	0.00	613.50	- 115
163	429.45	981.60	0.00	0.00	22.76	1433.81	61.35	61.35	0.00	46.01	168.71	+1265
164	937.43	343.56	66.00	10.55	81.37	1438.91	15.34	61.35	15.34	0.00	92.03	+1347
165	15.34	598.16	85.35	1.68	207.68	908.21	720.86	245.40	168.71	0.00	1134.98	- 227
166	0.00	337.43	28.45	3.35	145.09	514.32	92.03	0.00	122.70	0.00	214.73	+ 300

167	153.38	1042.95	14.23	0.84	22.75	1234.15	1104.30	0.00	61.35	0.00	1165.65	+ 68
168	0.00	400.00	0.00	9.21	128.03	537.24	337.43	0.00	30.68	398.78	766.88	- 230
169	30.68	644.18	34.14	5.03	85.34	799.37	322.09	0.00	76.69	398.78	797.55	+ 2
170	429.45	245.40	22.76	4.19	56.90	758.70	414.11	0.00	61.35	61.35	536.81	+ 222
171	0.00	0.00	0.00	0.00	0.00	0.00	92.03	0.00	46.01	0.00	138.04	- 138
172	61.35	199.39	0.00	4.19	153.63	418.56	414.11	0.00	383.44	0.00	797.55	- 379
173	429.45	661.97	34.14	11.72	91.04	1228.32	644.18	168.71	76.69	153.38	1042.95	+ 185
174	536.81	61.35	96.73	8.38	39.83	743.10	138.04	92.03	0.00	0.00	230.06	+ 513
175	490.80	55.83	0.00	14.24	79.66	640.53	490.80	0.00	168.71	674.85	1334.36	- 694
176	1652.46	60.74	21.74	0.00	116.87	1851.81	61.35	76.69	46.01	0.00	184.05	+1668
177	943.56	319.02	62.25	4.19	67.71	1396.73	322.09	15.34	107.36	322.09	766.88	+ 630
178	322.09	337.43	62.59	10.05	82.50	814.66	230.06	0.00	92.03	30.68	352.76	+ 462
179	276.07	276.07	25.61	0.00	91.04	668.79	398.78	122.70	0.00	122.70	644.18	+ 25
180	690.19	398.78	0.00	0.00	159.31	1248.28	966.26	184.05	184.05	15.34	1349.70	- 101
181	736.20	0.00	28.45	3.35	65.44	833.44	168.71	0.00	122.70	107.36	398.78	+ 435

* Deleted. Missing information, regression.

**Deleted. Outlier.

BIOGRAPHICAL SKETCH

Linda Dean Shalik was born November 17, 1948, in Columbus, Ohio. She attended public schools in Franklin County, Ohio, and graduated from Groveport-Madison High School, Groveport, Ohio, in 1966. As a student, she was active in county and state 4-H activities, both as a member and a junior leader. Ms. Shalik graduated from Ohio State University in September, 1971, with a Bachelor of Science degree in occupational therapy. Upon graduation, she took a position at the Ohio State University Hospitals as a staff occupational therapist and later moved to Los Angeles, California, where she worked as a therapist in the Spinal Injury and Stroke Services at the Rancho Los Amigos Rehabilitation Hospital.

In 1974, she accepted the senior staff position in the spinal injury service at the Mississippi Methodist Rehabilitation Center in Jackson, Mississippi. While in Mississippi, Ms. Shalik also developed a private practice in which she provided occupational therapy consultation services to nursing homes as well as home health agencies in the area. She was active in the development of the Mississippi Occupational Therapy Association and served as its first president.

In 1978, Ms. Shalik transferred to Arkansas where she worked as a consultant therapist at the Southeast Arkansas Human Development

Center. She also provided home visit services to rural clients as a representative of the Arthritis Foundation. In 1981, she accepted a teaching position in occupational therapy at the University of Arkansas at Pine Bluff. From this experience, she developed an interest in academia and entered graduate school at the University of Florida in June, 1982. She received the Master of Education degree in 1983, with a major in vocational, technical, and adult education. Since that date she has been studying toward the Doctor of Philosophy degree in educational leadership while concurrently practicing as a contract occupational therapist in mental retardation facilities.

Ms. Shalik is a member and registered occupational therapist with the American Occupational Therapy Association. She is also a licensed occupational therapist in the State of Florida. She currently resides in Archer, Florida, with her husband, Harold, and daughter, Claire.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Michael Y. Nunnery, Chairman
Professor of Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

James W. Hensel
Professor of Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

C. Arthur Sandeen
Professor of Educational Leadership

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May, 1986

Dean, College of Education

Dean, Graduate School